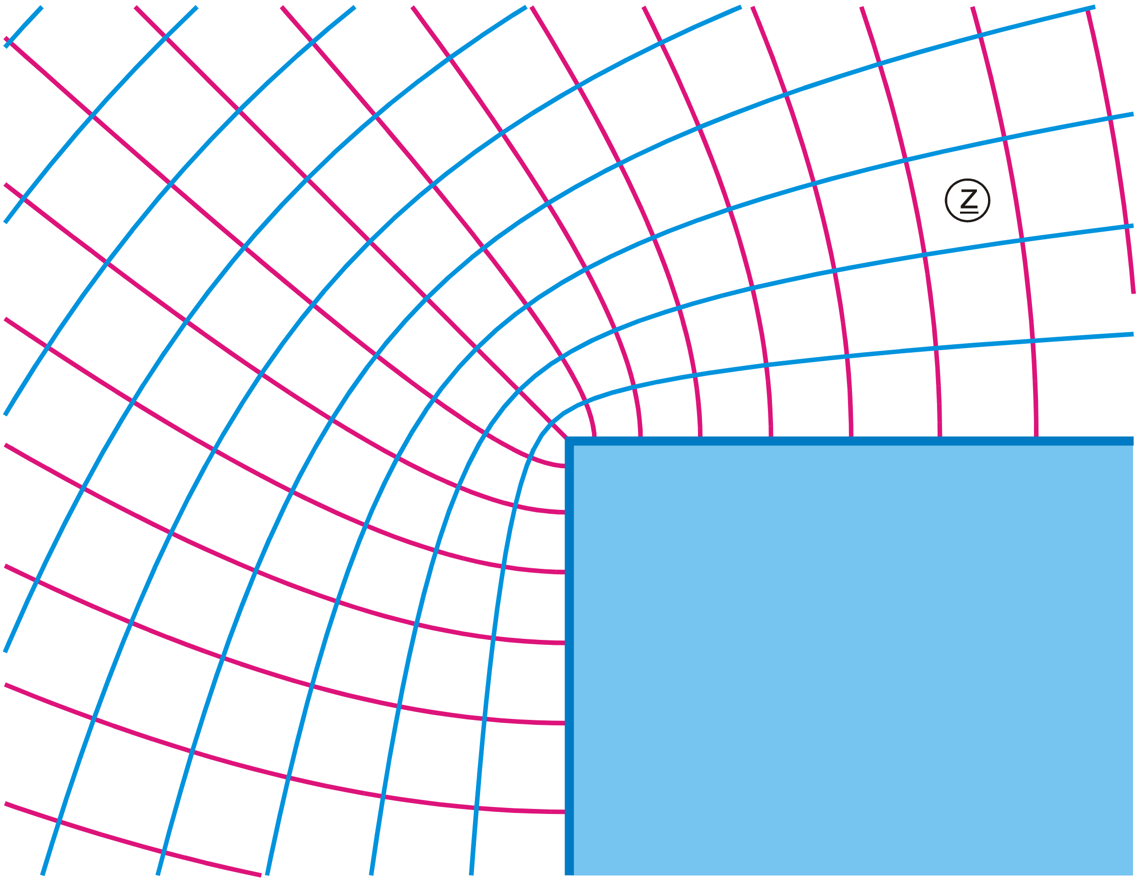
Abbildungen Gruppe A

Eine unendlich ausgedehnte, leitende Oberfläche



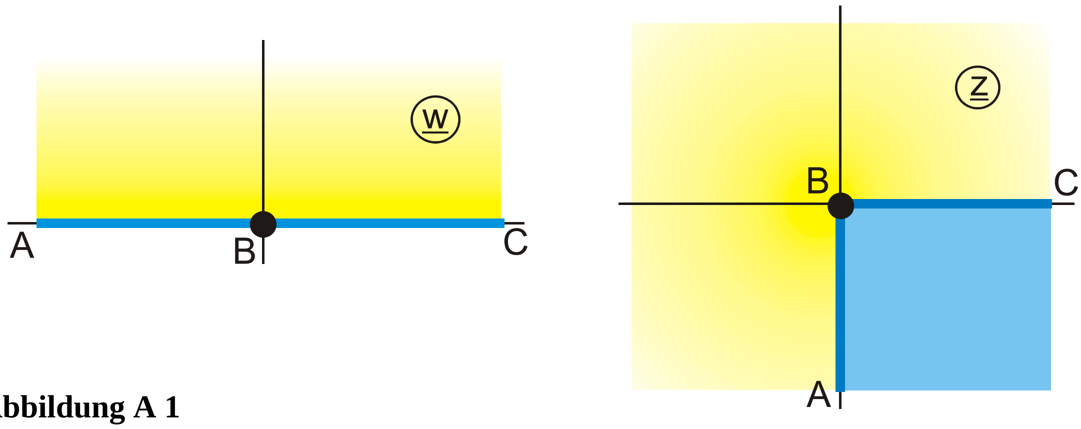


Abbildung A 1

$z = w^{3/2}$

$-1{,}5 \leq u \leq 1{,}5$ $\quad$ $0 \leq v \leq 1{,}5$

$w_1 = (0{,}0) \Rightarrow z_1 = (0{,}0)$ $\quad$ $w_2 = (1{,}0) \Rightarrow z_2 = (1{,}0)$

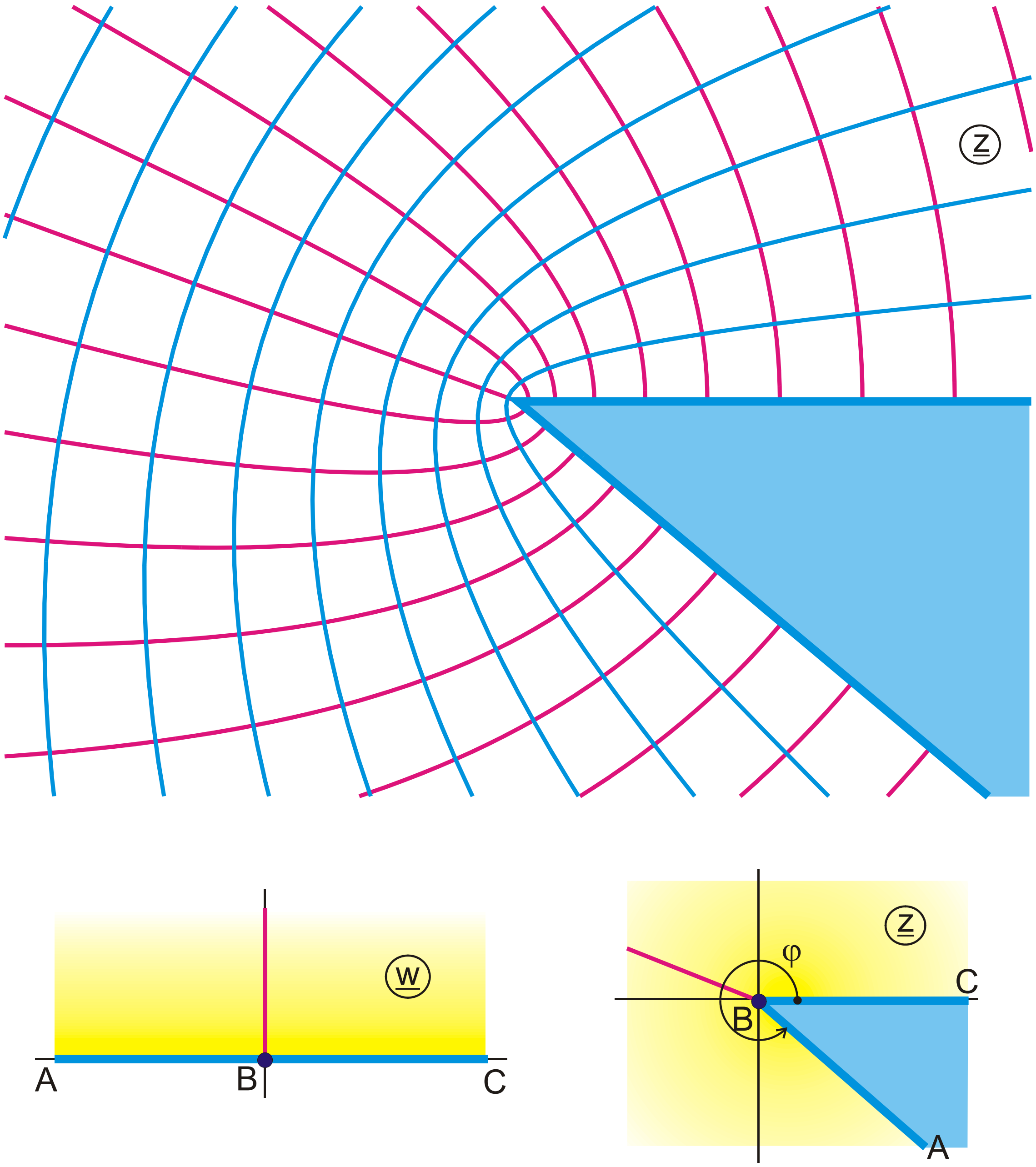


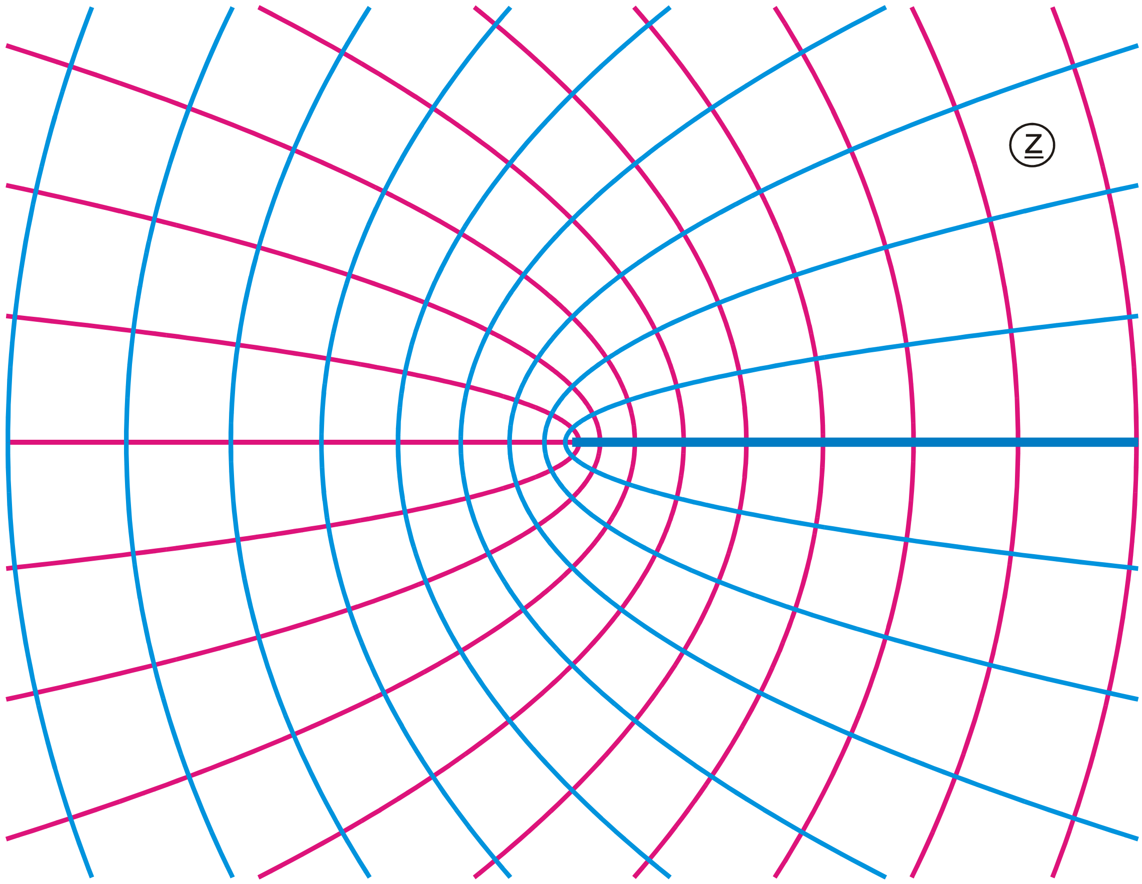
Abbildung A 1.1 (Hyperbeln für φ = 90°)

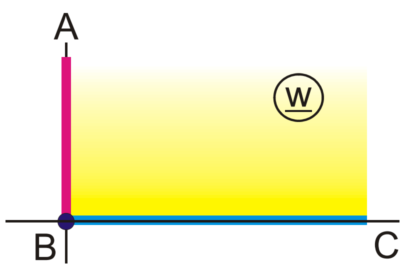
$z = w^{\varphi/\pi}$

$0 \leq \varphi \leq 2\pi$

$-1{,}5 \leq u \leq 1{,}5$ $0 \leq v \leq 1{,}5$

$w_1 = (0{,}0) \Rightarrow z_1 = (0{,}0)$ $w_2 = (1{,}0) \Rightarrow z_2 = (1{,}0)$





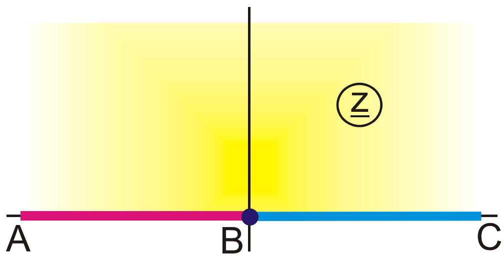


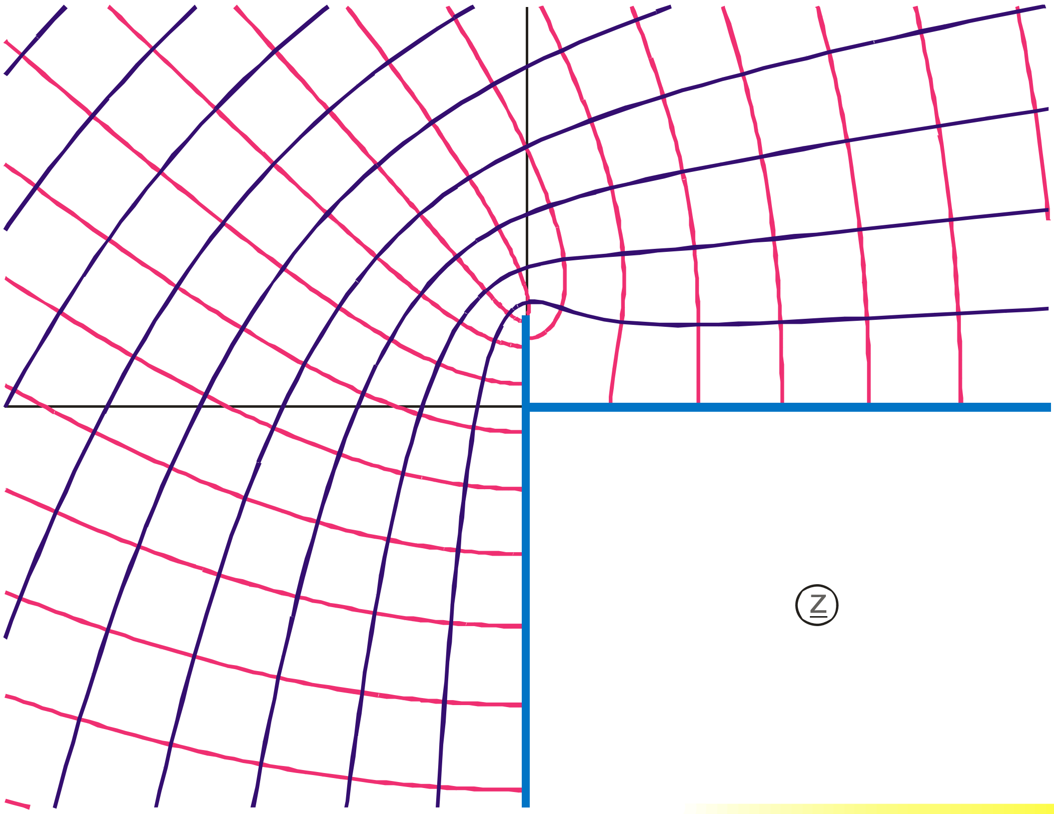
Abbildung A 1.2 (Parabeln)

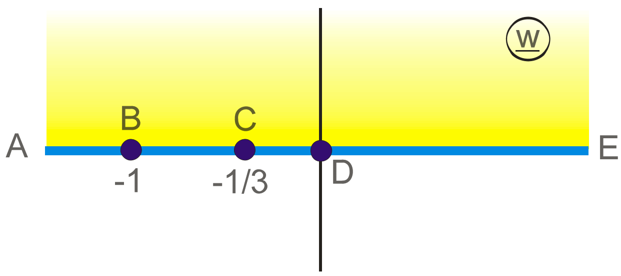
$z = w^2$

$-1,5 \leq u \leq 1,5$ $0 \leq v \leq 1,5$

$w_1 = (0,0) \Rightarrow z_1 = (0,0)$ $w_2 = (1,0) \Rightarrow z_2 = (1,0)$

Vs. 1.2





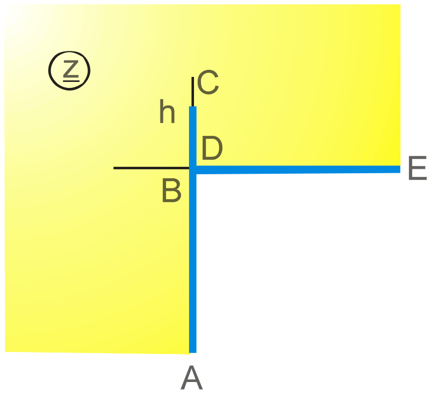


Abbildung A 2

$$z = \sqrt{w}(w+1)$$

$$h = \frac{2}{3\sqrt{3}}$$

$-2 \leq u \leq 2$ $0 \leq v \leq 2$

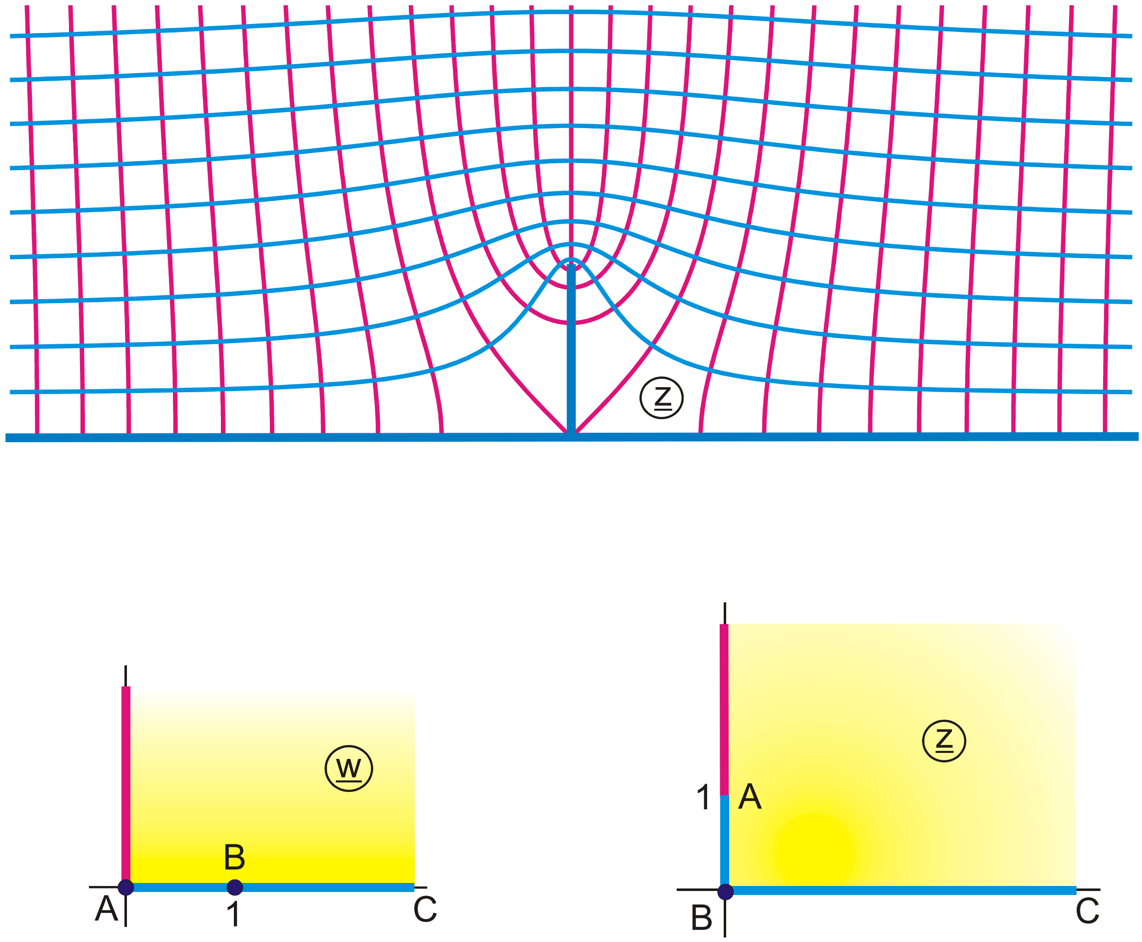


Abbildung A 2.1

$z = \sqrt{w^2 - 1}$

$-5 \leq u \leq 5$

$0 \leq v \leq 2{,}5$

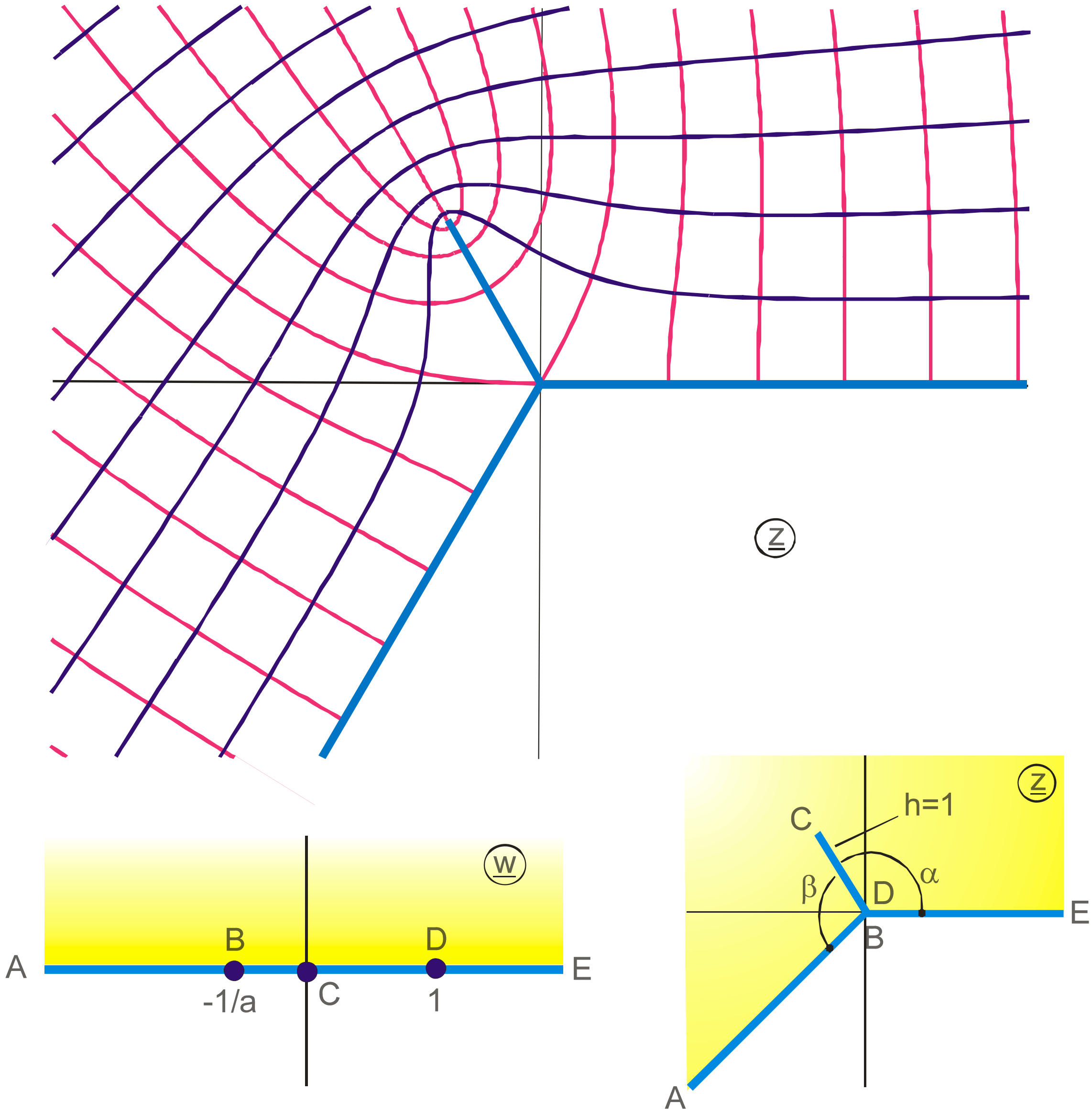


Abbildung A 2.2

$$z = (w-1)^{\alpha/\pi}(aw+1)^{\beta/\pi}$$

$$a = \frac{\alpha}{\beta}$$

$-2{,}5 \le u \le 2{,}5$

$0 \le v \le 2{,}5$

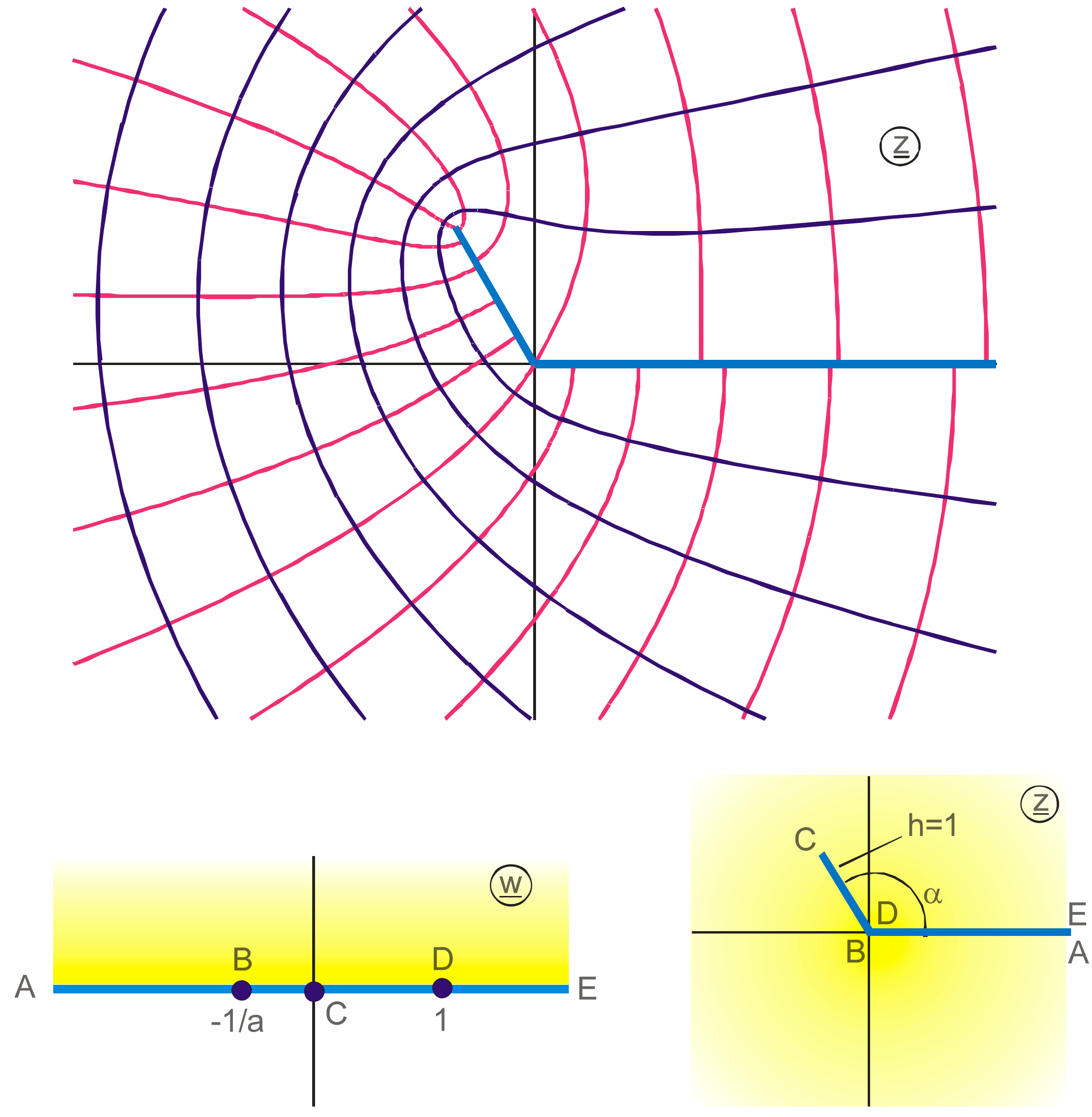


Abbildung A 2.3

$$z = (w-1)^{\alpha/\pi}(aw+1)^{(2-\alpha)/\pi}$$

$$a = \frac{\alpha}{2\pi - \alpha}$$

$-2{,}5 \leq u \leq 2{,}5$

$0 \leq v \leq 2{,}5$

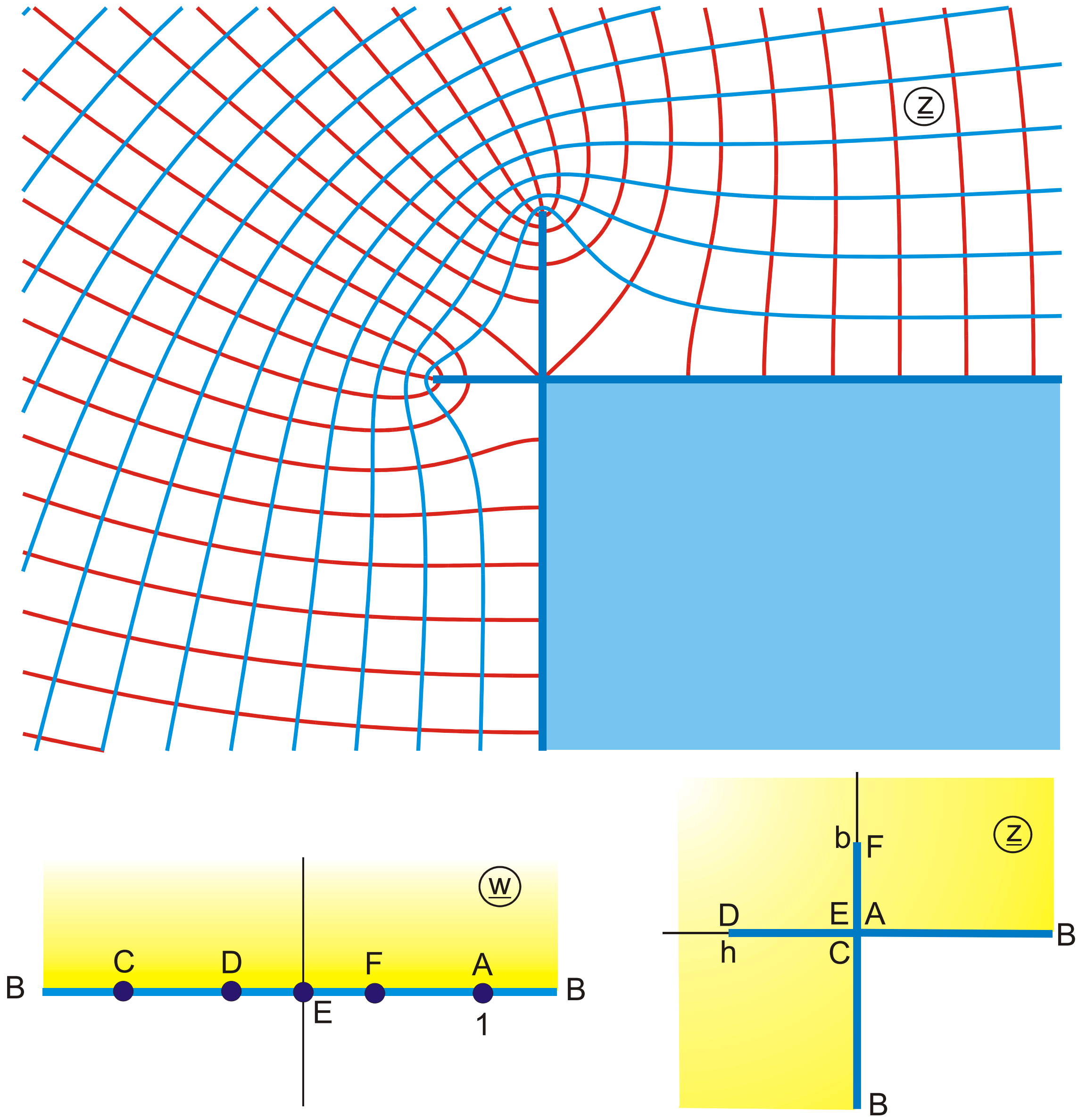


Abbildung A 2.4

$w_1 = \sqrt{1 - 1/w}$

$w_2 = F_a(w_1, k)$

$w_3 = K(k) + jK'(k) - w_2$

$z = -\operatorname{sn} w_3 \operatorname{cn} w_3 \operatorname{dn} w_3$

gegeben: k

$u_C = \frac{k^2}{k^2-1} = -\left(\frac{k}{k'}\right)^2$

$-1{,}5 \le u \le 2$

$0 \le v \le 2$

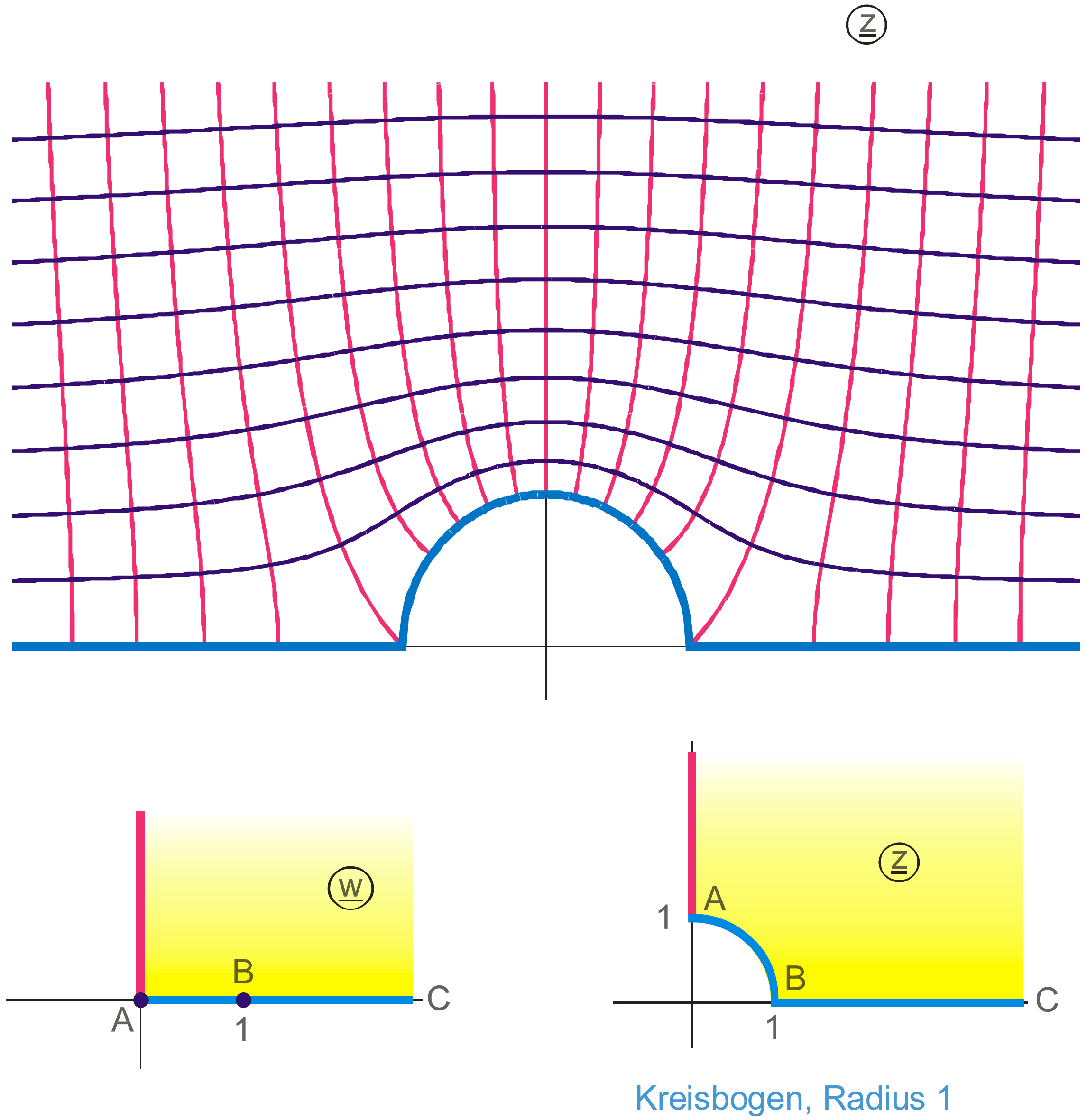
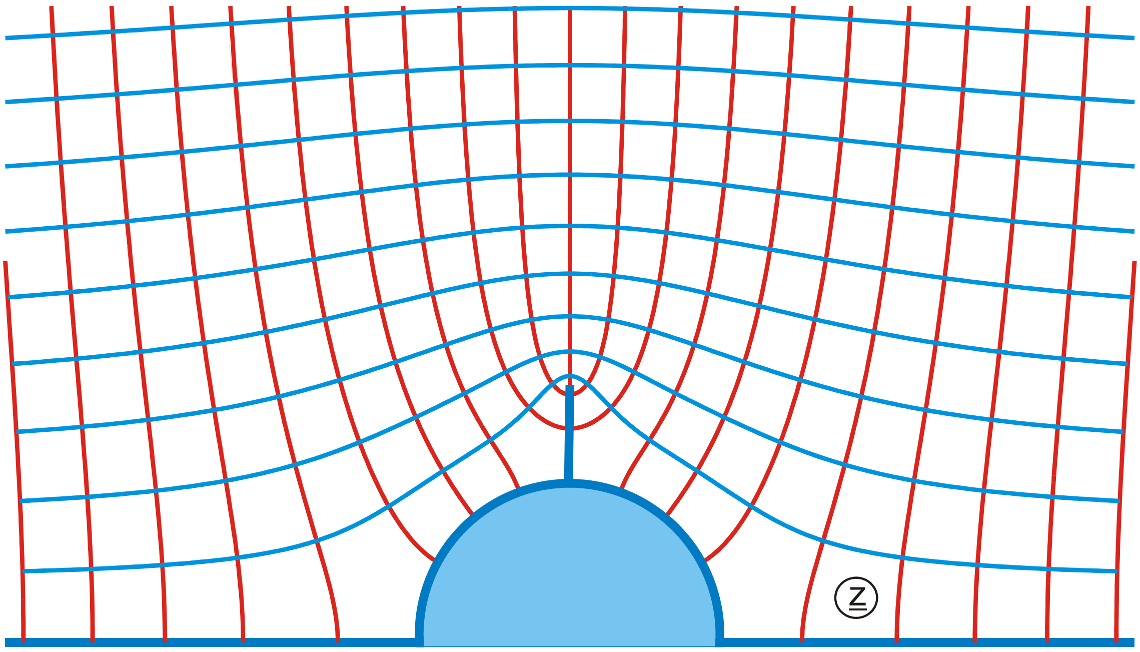


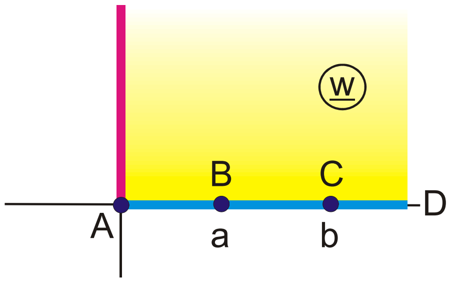
Abbildung A 3

$z = w + \sqrt{w^2 - 1}$

$-2 \le u \le 2$

$0 \le v \le 2$





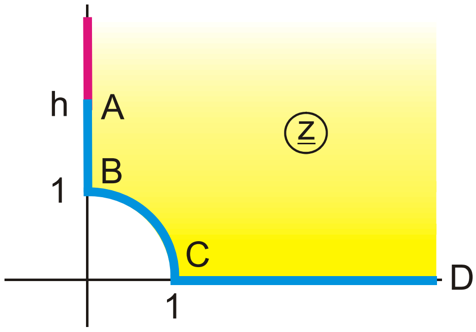


Abbildung A 3.1

$z = t + \sqrt{t^2 - 1}$

$t = \sqrt{w^2 - a^2}$

$h = a + \sqrt{a^2 + 1}$

$a = \dfrac{h^2 - 1}{2h}$

$u_B = \sqrt{a^2 + 1}$

$-2{,}5 \le u \le 2{,}5$ $\qquad$ $0 \le v \le 2{,}5$

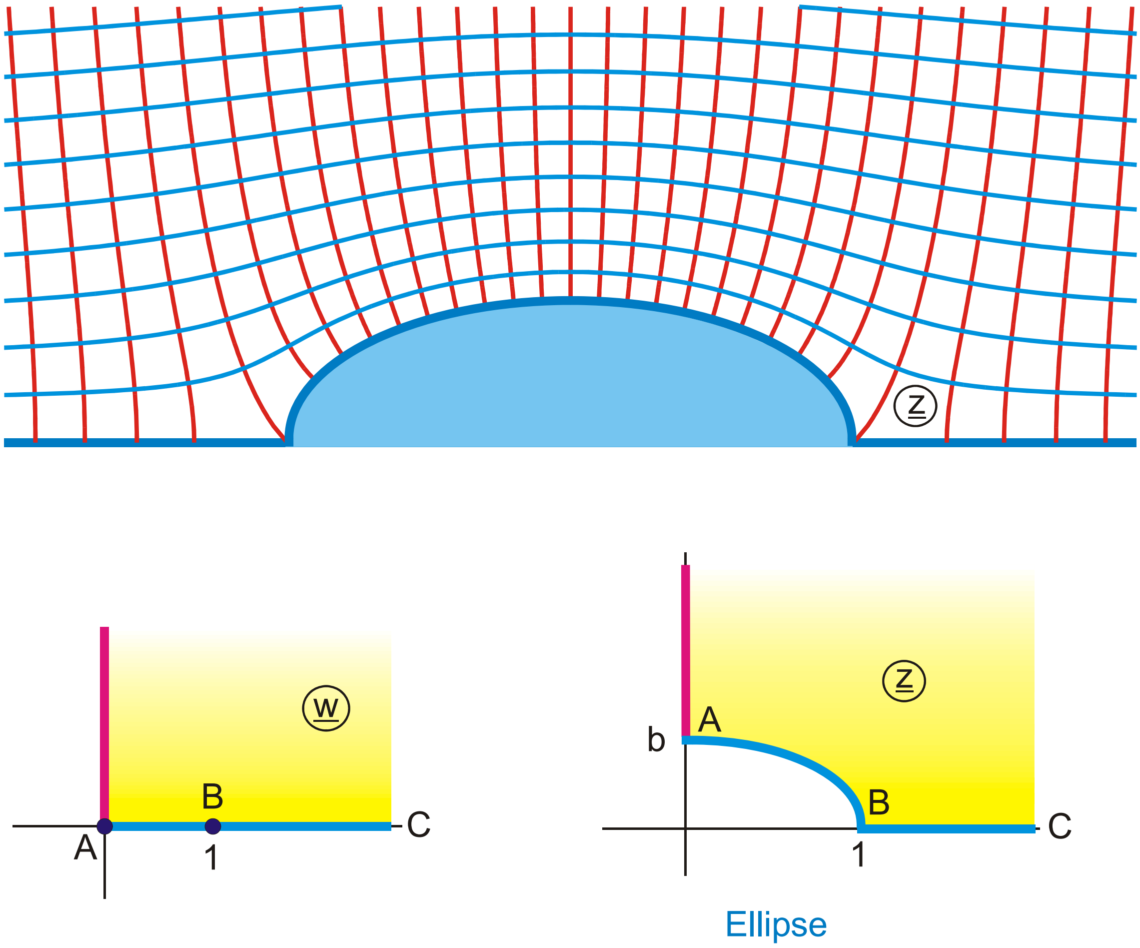


Abbildung A 3.2

$z = w + b\sqrt{w^2 - 1}$

$b = 0{,}5$

$0 \leq u \leq 4$

$0 \leq v \leq 2{,}4$

obere Hälfte von Abb. A 3.9

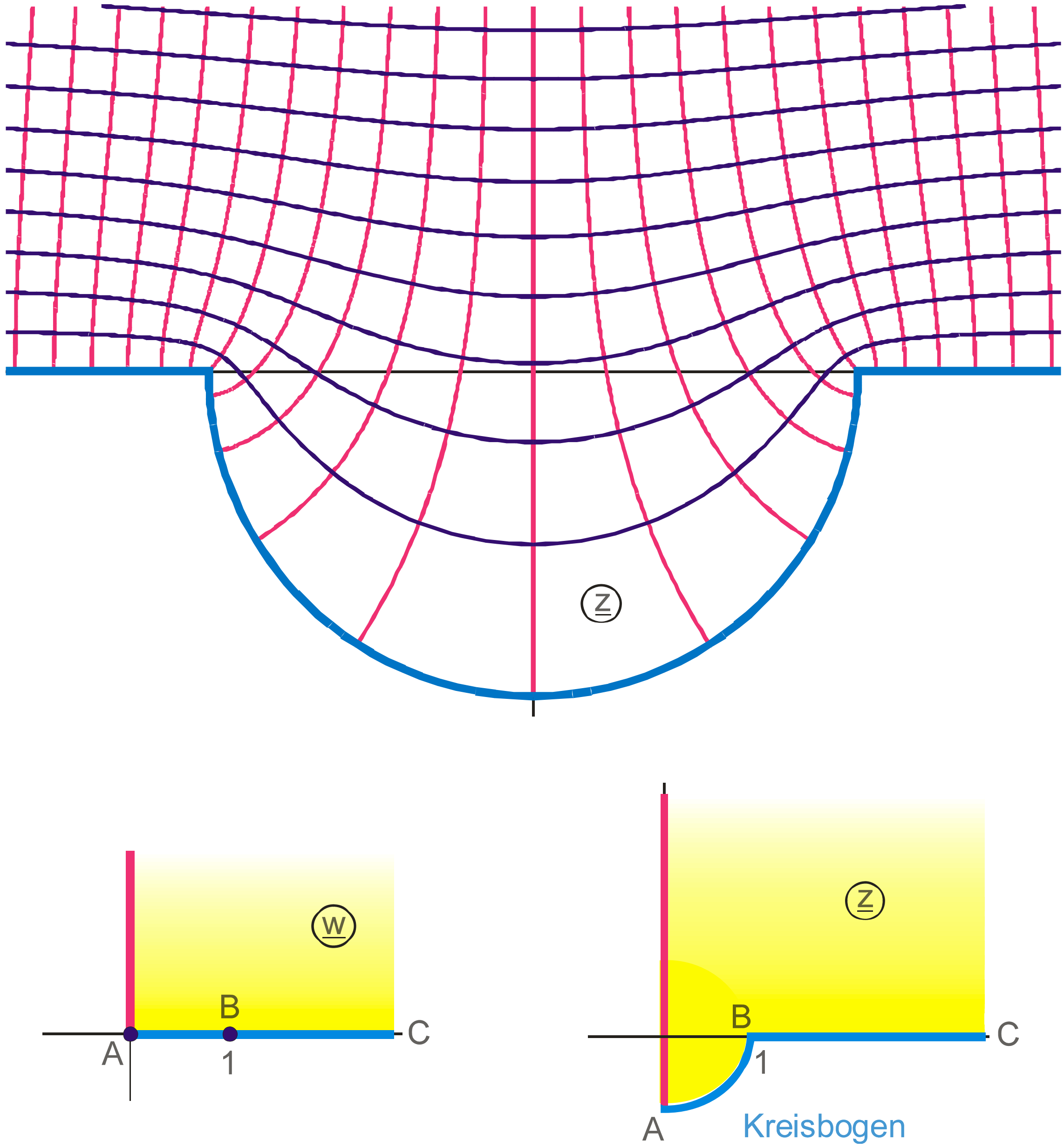


Abbildung A 3.3

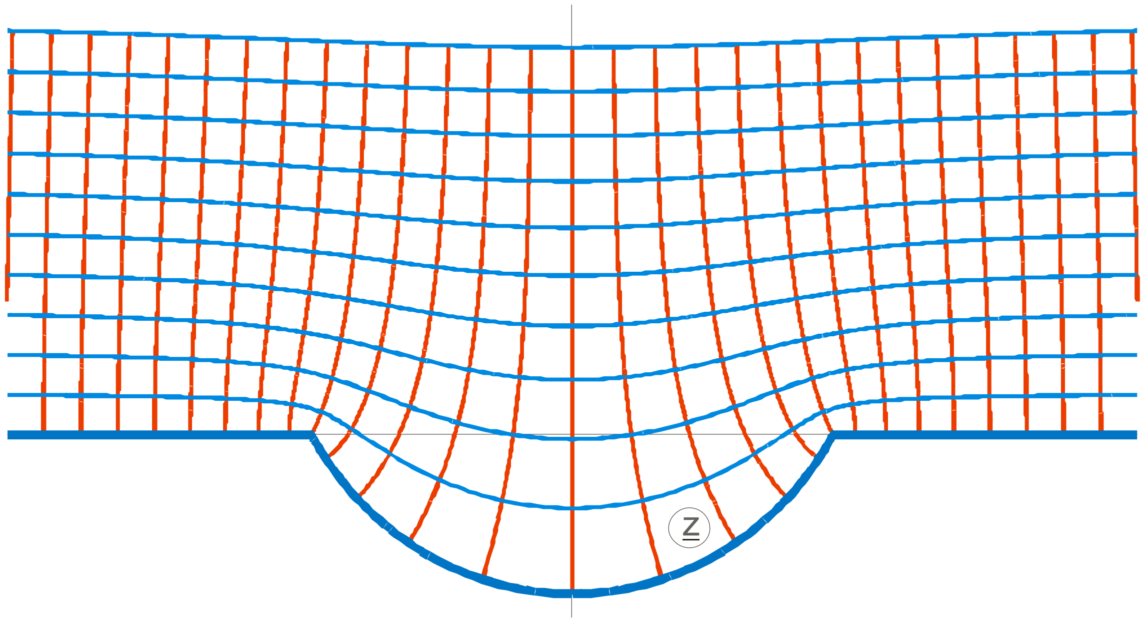
$$z = \frac{w_2 + 1}{w_2 - 1}$$

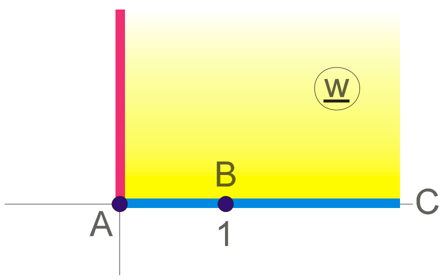
$$w_2 = w_1^{3/2}$$

$$w_1 = \frac{w + 1}{w - 1}$$

$-4 \leq u \leq 4$

$0 \leq v \leq 2$





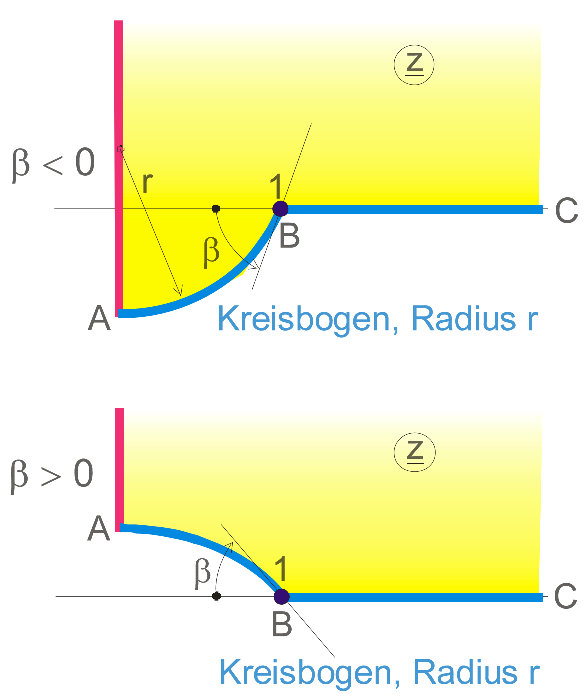


Abbildung A 3.4

$$z = \left(\frac{w_1 + 1}{w_1 - 1}\right)$$

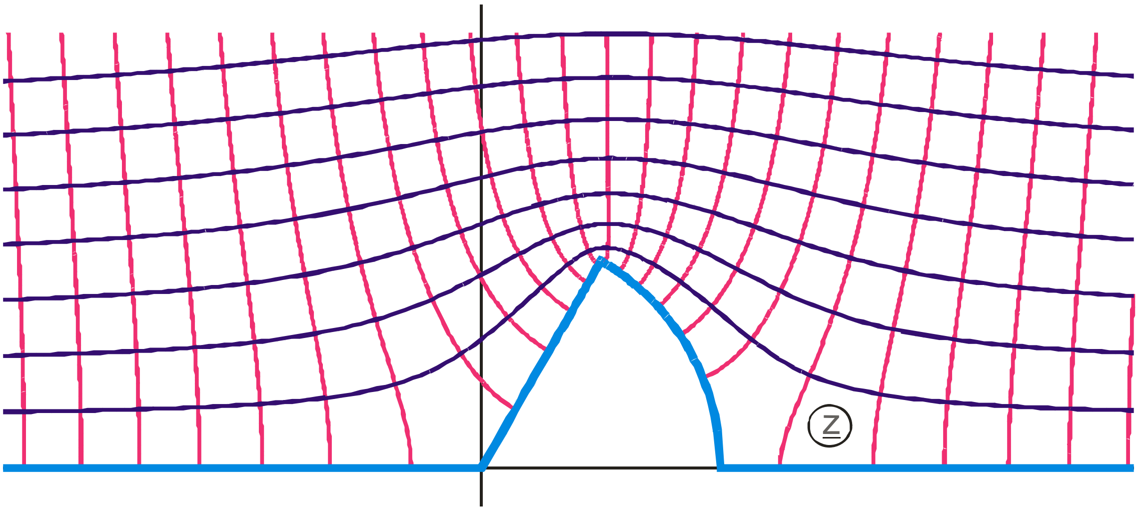
$$w_1 = \left(\frac{w + 1}{w - 1}\right)^{\alpha}$$

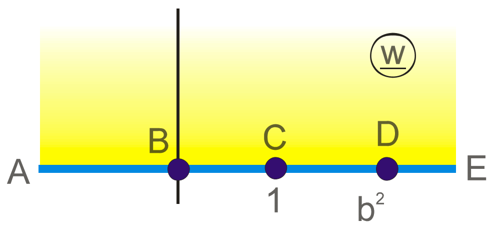
$-\pi < \alpha < \pi$ Kreisbogen nach außen für $\beta < 0$

$\alpha = 1 - \beta/\pi$

$h = \tan(\beta/2)$ $r = 1/\sin\beta$

$\beta = -120°$ $-5 \le u \le 5$ $0 \le v \le 2{,}5$





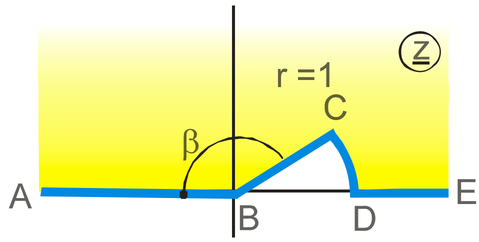


Abbildung A 3.5

$$z = \left(\frac{w_1 + 1}{w_1 - 1}\right)\left(\frac{bw_1 - 1}{bw_1 + 1}\right)^{1/b}$$

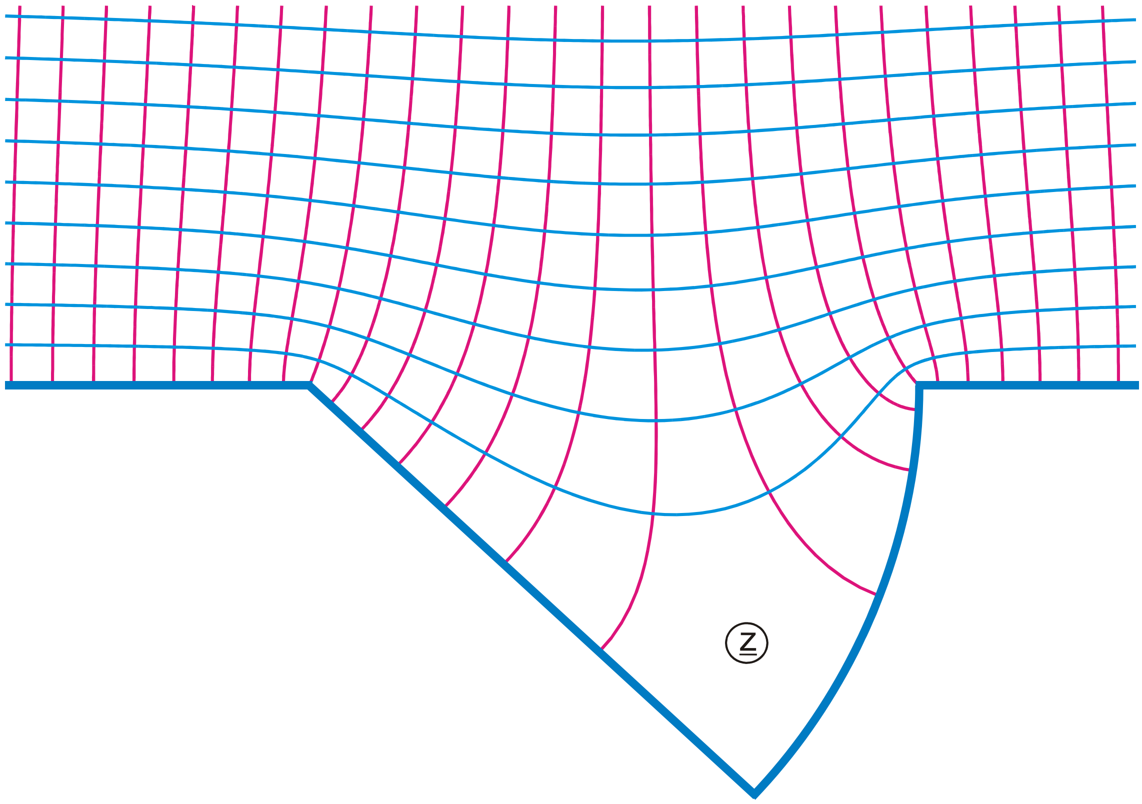
$$w_1 = \frac{1 - w}{b^2 - w}$$

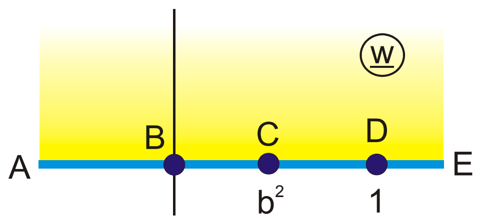
$0 < \beta < \pi$

$\beta = \pi/b$

$b = \pi/\beta$

$\beta = 120°$ für $b = 1{,}5$





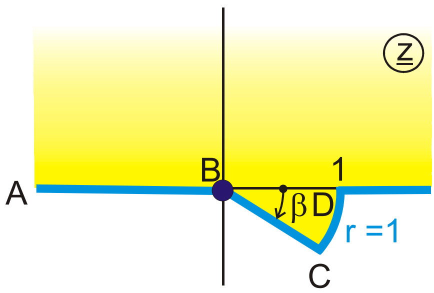


Abbildung A 3.6

$$z = -e^{-j\pi/b}\left(\left(\frac{w_1 - 1}{w_1 + 1}\right)\left(\frac{bw_1 + 1}{bw_1 - 1}\right)\right)^{1/b}$$

$$w_1 = -\sqrt{\frac{1-w}{b^2 - w}}$$

$0 < \beta < \pi$

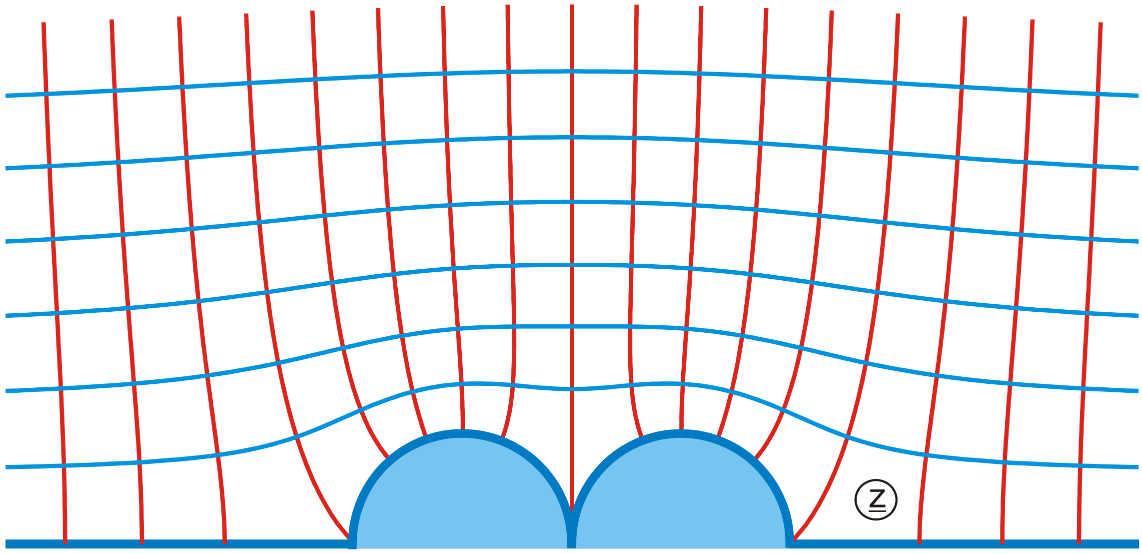
$\beta = \pi/b - \pi$

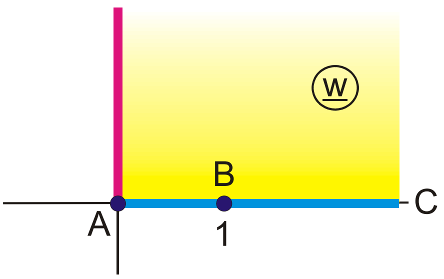
$b = \pi/(\pi+\beta)$

$\beta = 43{,}25°$

$-2 \le u \le 2$

$0 \le v \le 2$





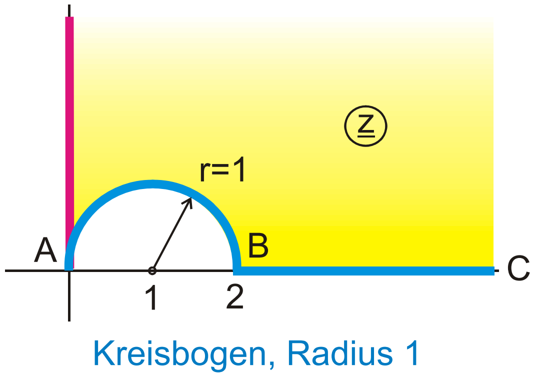
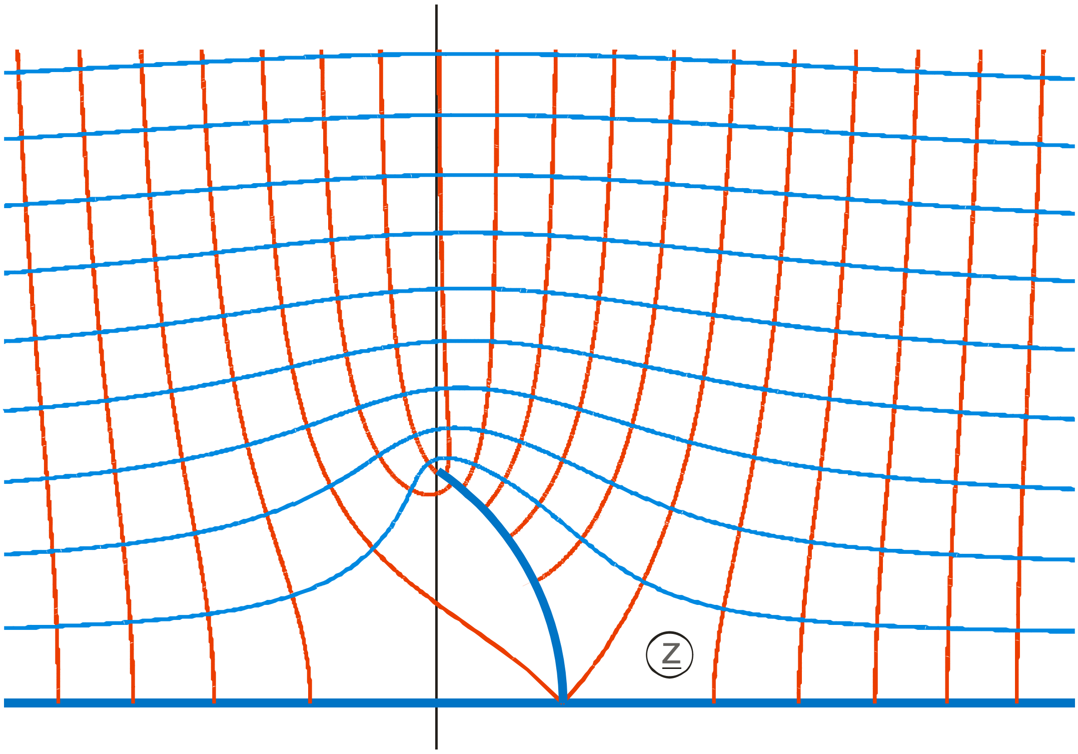


Abbildung A 3.7

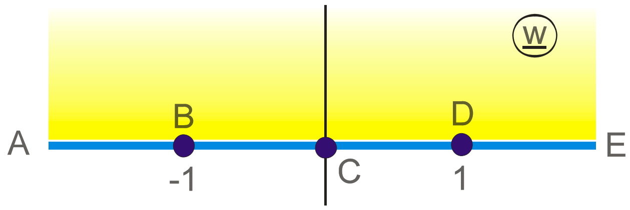
$$z = \frac{\pi}{\arcsin(1/w)}$$

$-2 \le u \le 2$

$0 \le v \le 1$



Kreisbogen, Radius r, Endpunkt auf der y-Achse



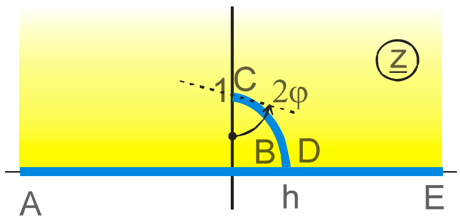


Abbildung A 3.8

$$z = -j(w_2 + 1/w_2)/2$$

$$w_2 = \frac{w_1 + j\sin\varphi}{\cos\varphi}$$

$$w_1 = j(w + \sqrt{w^2 - 1})$$

$0 < \varphi < \pi$

$h = \tan\varphi$ $\quad$ $r = 1/\sin(2\varphi)$

$\varphi = 30°$ $\quad$ $-2{,}5 \le u \le 2{,}5$ $\quad$ $0 \le v \le 2{,}5$

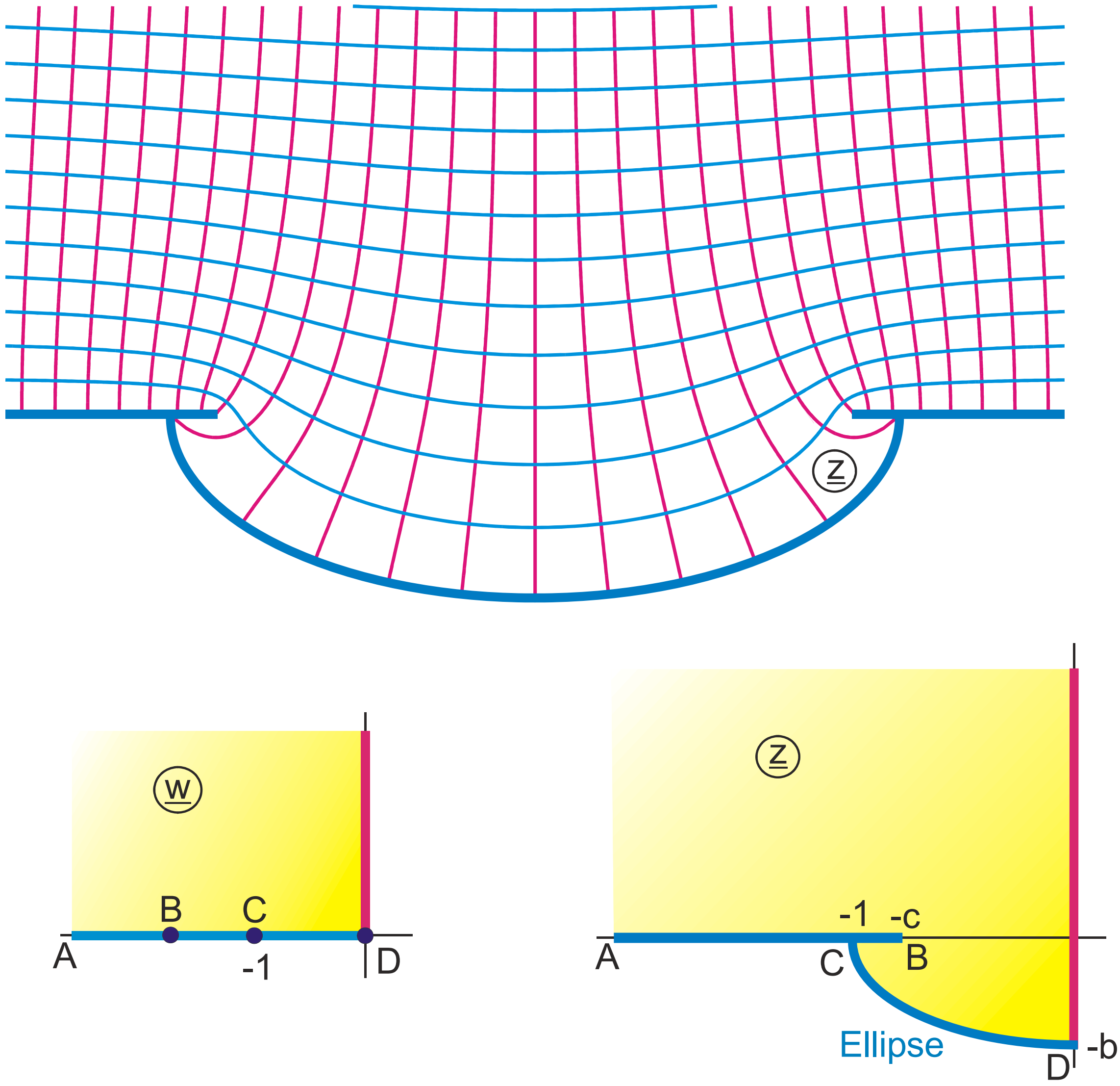


Abbildung A 3.9

$z = w + b\sqrt{w^2 - 1}$

gegeben: b

$b = 0{,}5$

Brennpunkt $c = \sqrt{1 - b^2}$

$-4 \le u \le 0$

$0 \le v \le 2{,}4$

untere Hälfte von Abb. A 3.2

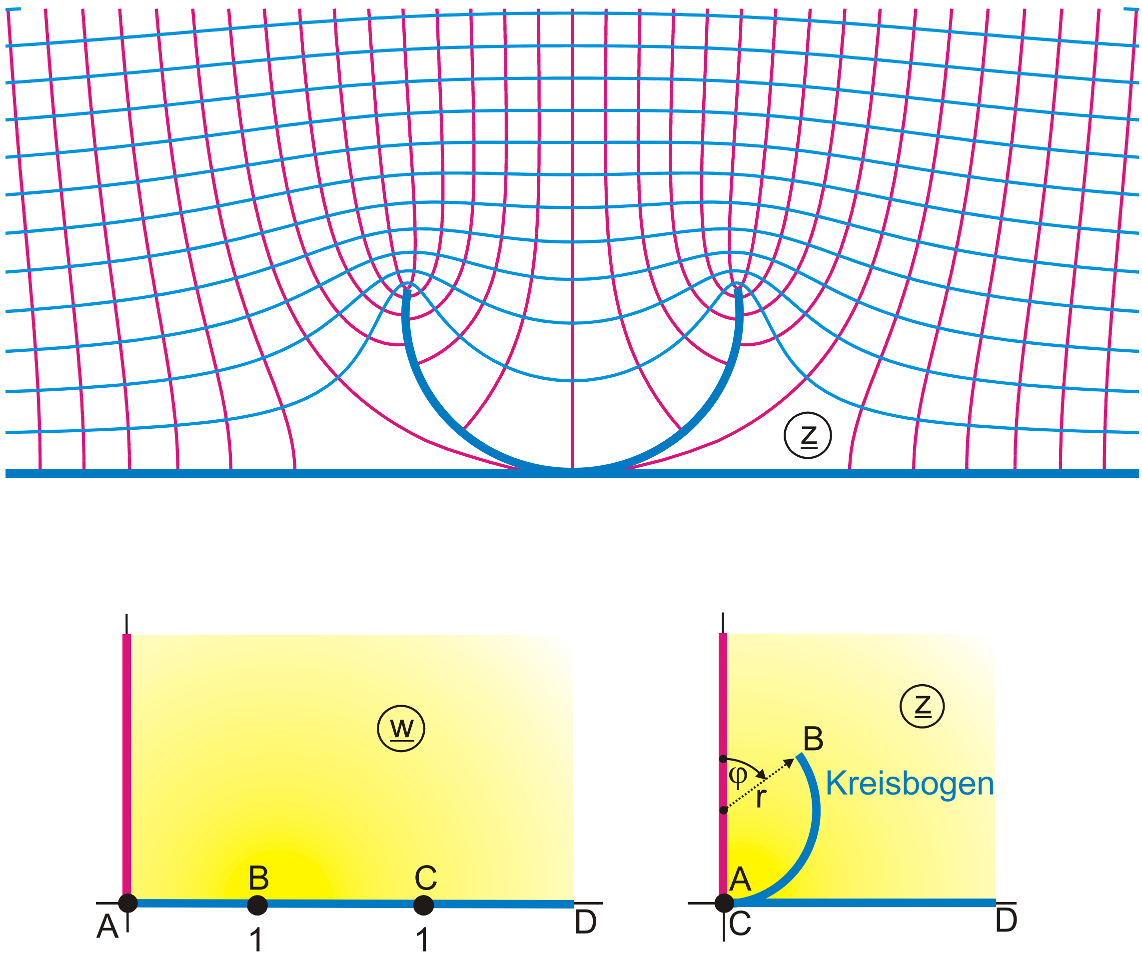


Abbildung A 3.10

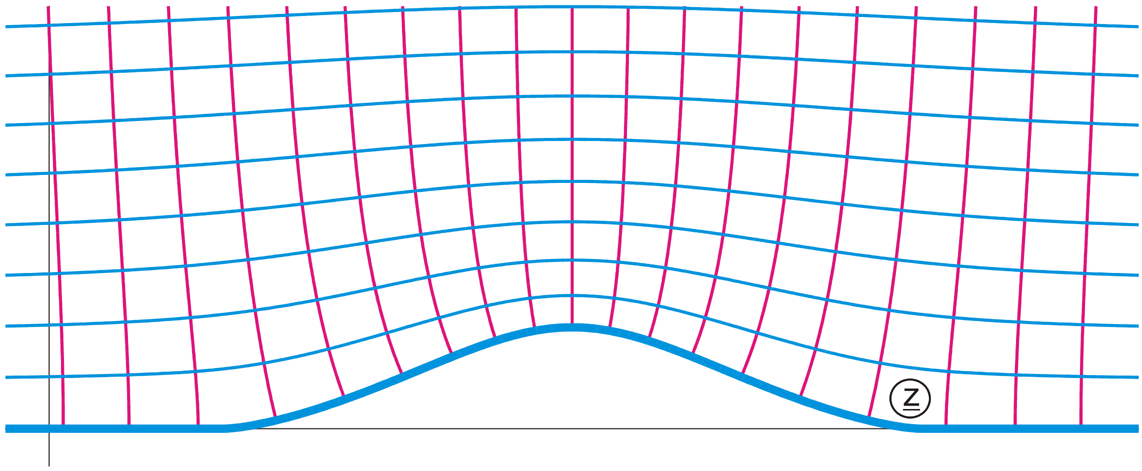
$$z = \frac{1}{w_1}$$

$$w_1 = \frac{b}{w} + \operatorname{ar\,tanh}\frac{1}{w}$$

gegeben: b

$0 \le u \le 2$

$0 \le v \le 1{,}2$



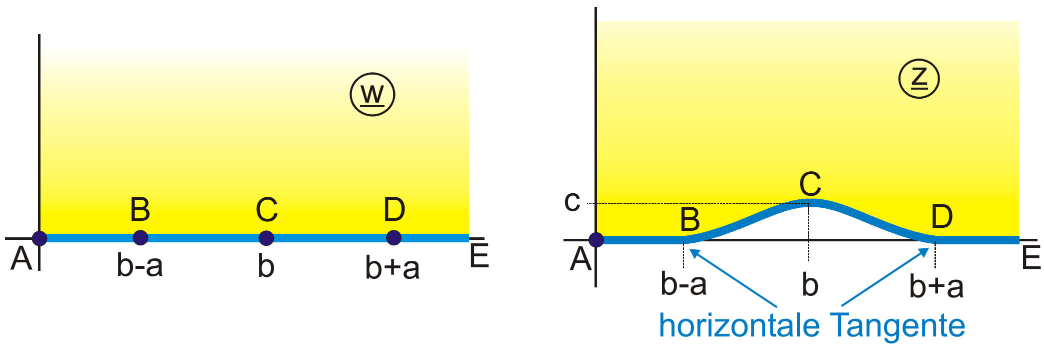


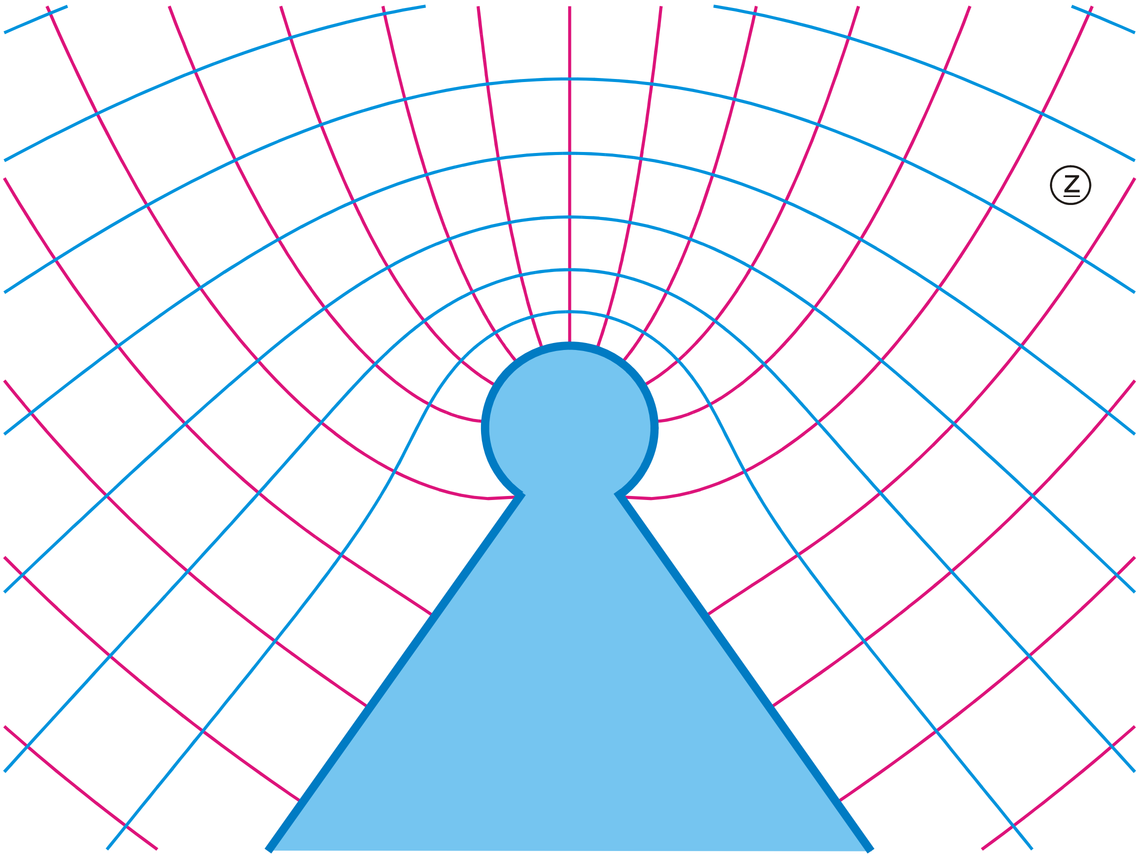
Abbildung A 3.11

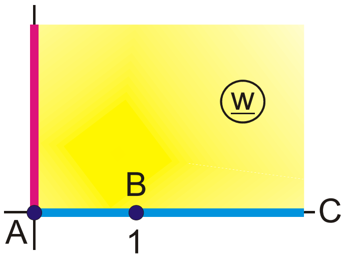
$$z = w - \frac{h}{a^2}\left[\sqrt{(w-b_1)^3(w-b_2)^3} - (w-b_1)(w-b_2)(w-b)\right]$$

$b_1 = b - a$ $\qquad$ $b_2 = b + a$

gegeben: b, a, h $\qquad$ $c = a\,h$

$0 \le u \le 0{,}5$ $\qquad$ $0 \le v \le 0{,}5$





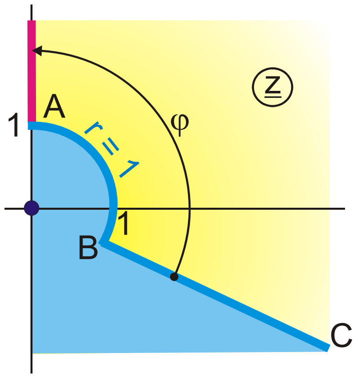


Abbildung A 3.12

$z = w_1^{\varphi} \exp(-j\beta)$

$w_1 = w + \sqrt{w^2 - 1}$

$\beta = \varphi - \dfrac{\pi}{2}$

$0 \le u \le 3$

$0 \le v \le 2$

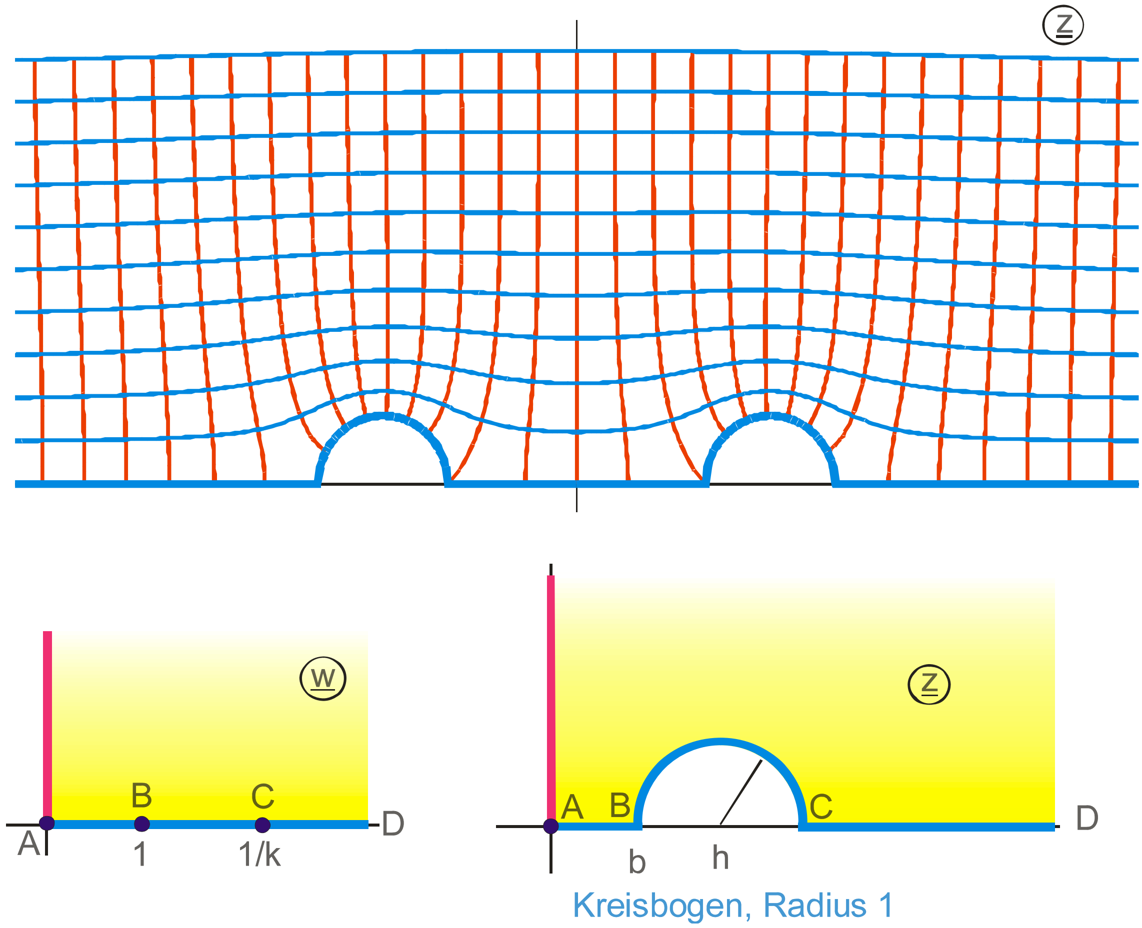


Abbildung A 4

$$z = \frac{\sigma - w_4}{\sigma w_4 - 1} + h$$

$w_4 = w_3/\sigma^2$

$w_3 = \exp\,(w_2)$

$w_2 = (w_1 + K - jK')\,\pi / K'$

$w_1 = F_k(w, k)$

$\sigma = h + \mathrm{sqr}(h^2 - 1)$

$\tau = \pi / \ln \sigma$

$$k = \left(\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right)^2$$

$0 \le u \le 10$

$0 \le v \le 5$

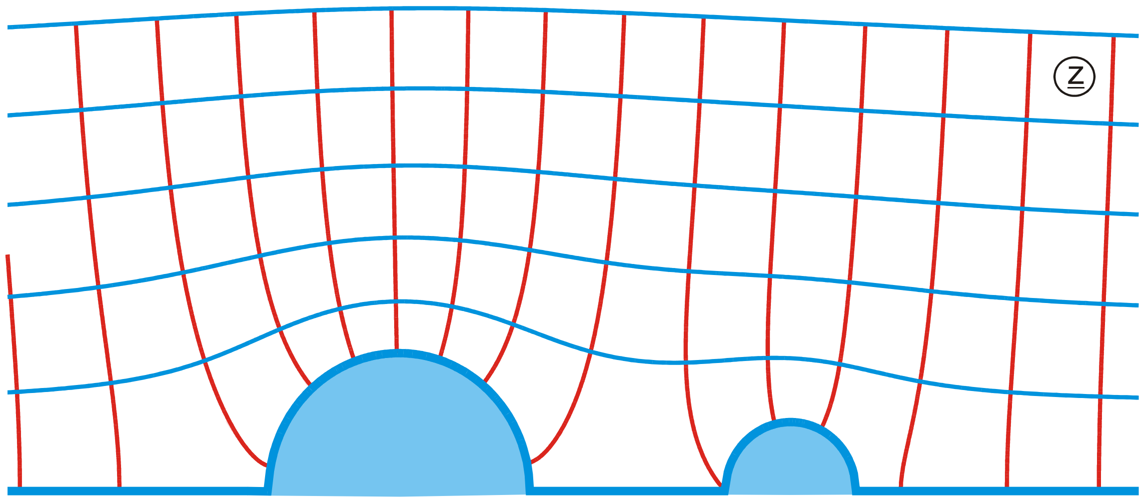
$h = (\sigma + 1/\sigma)/2$

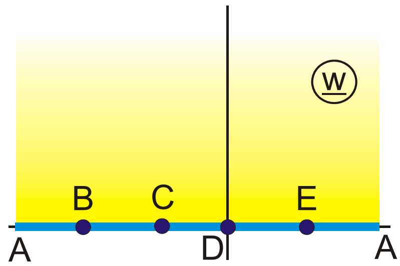
$\sigma = \exp\,(\pi K / K')$

$$b = \frac{1/\sigma + \sigma^2}{1 + \sigma} - h$$

$h = \cosh\,(\pi/\tau)$

$k = 0{,}2$





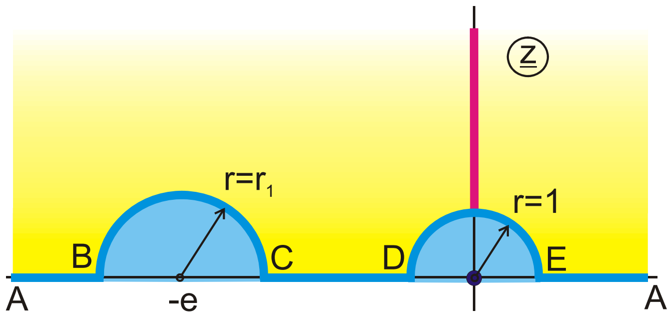
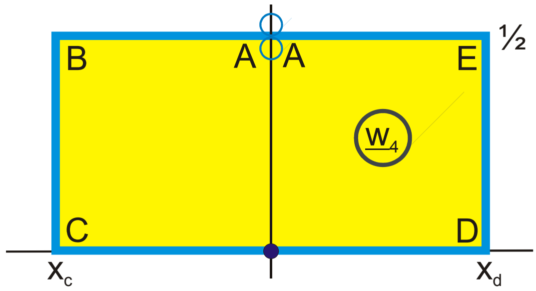


Abbildung A 4.1



$z = a\tanh(w_4\pi) - d_2$

$w_4 = w_3/(2\tau) + x_a$

$w_3 = 1 + j\tau - w_2$

$w_2 = F_a(w_1, k)/K(k)$

$w_1 = \sqrt{b - 1/w}$

gegeben: r_1, $e > 1 + r_1$

$f = (r_1^2 + 1 - e^2)/2$

$a = \sqrt{f^2 - r_1^2}\,/\,e$

$d_1 = \sqrt{a^2 + r_1^2}$

$d_2 = \sqrt{a^2 + 1}$

$x_a = -\dfrac{1}{2\pi}\operatorname{ar\,sinh}\sqrt{(d_1/r_1)^2 - 1}$

$x_d = \dfrac{1}{2\pi}\operatorname{ar\,sinh}\sqrt{d_2^2 - 1}$

$k = \left(\dfrac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right)^2$

$b = \operatorname{sn}^2\left(d \cdot K(k), k\right)$

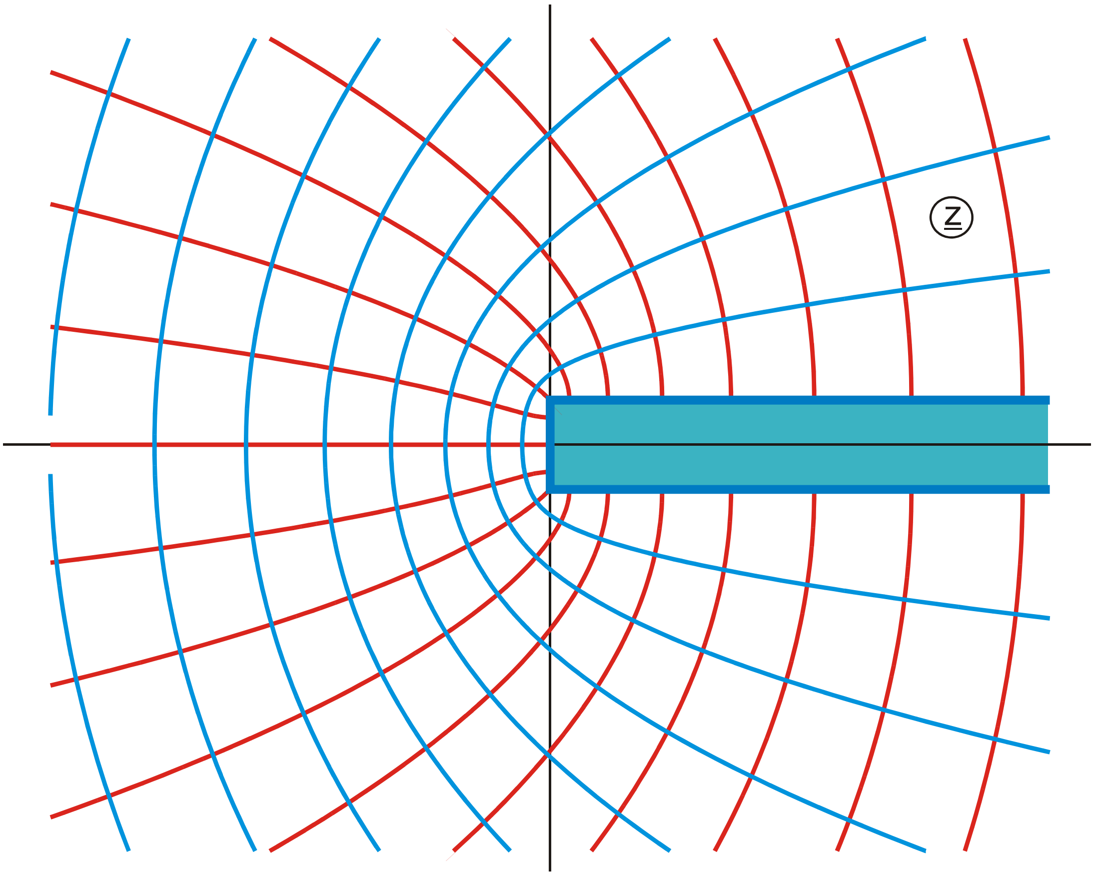
$\tau = \dfrac{1}{2(x_d - x_a)}$

$d = 2\,\tau\,x_d$

$u_B = 1/(b-1)$

$u_C = 1/(b-1/k^2)$

$u_E = 1/b$



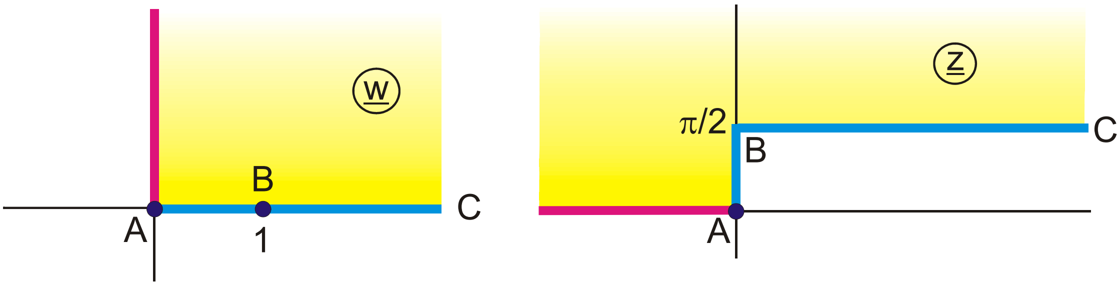
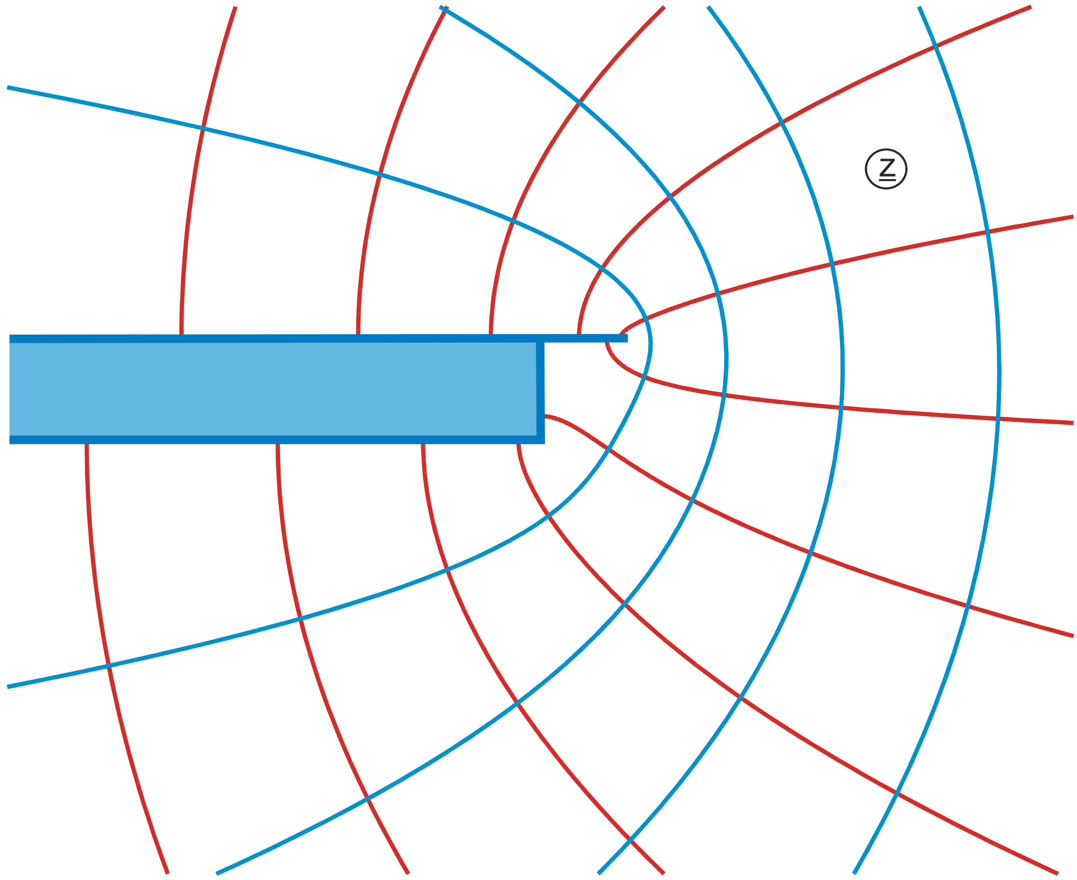


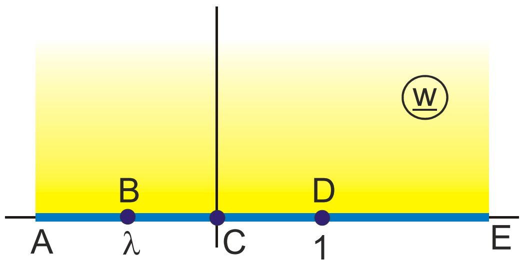
Abbildung A 5

$$z = w\sqrt{w^2 - 1} - \ln\left(w + \sqrt{w^2 - 1}\right) + j\frac{\pi}{2}$$

$0 \le u \le 5$

$0 \le v \le 5$





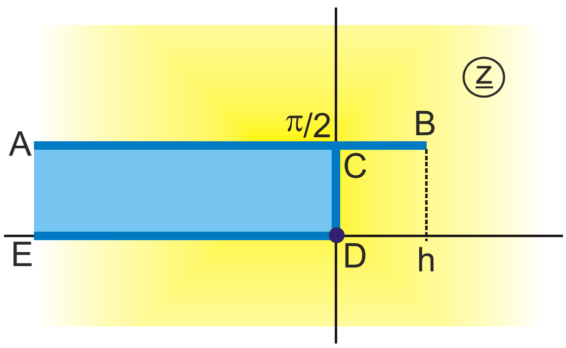


Abbildung A 5.1

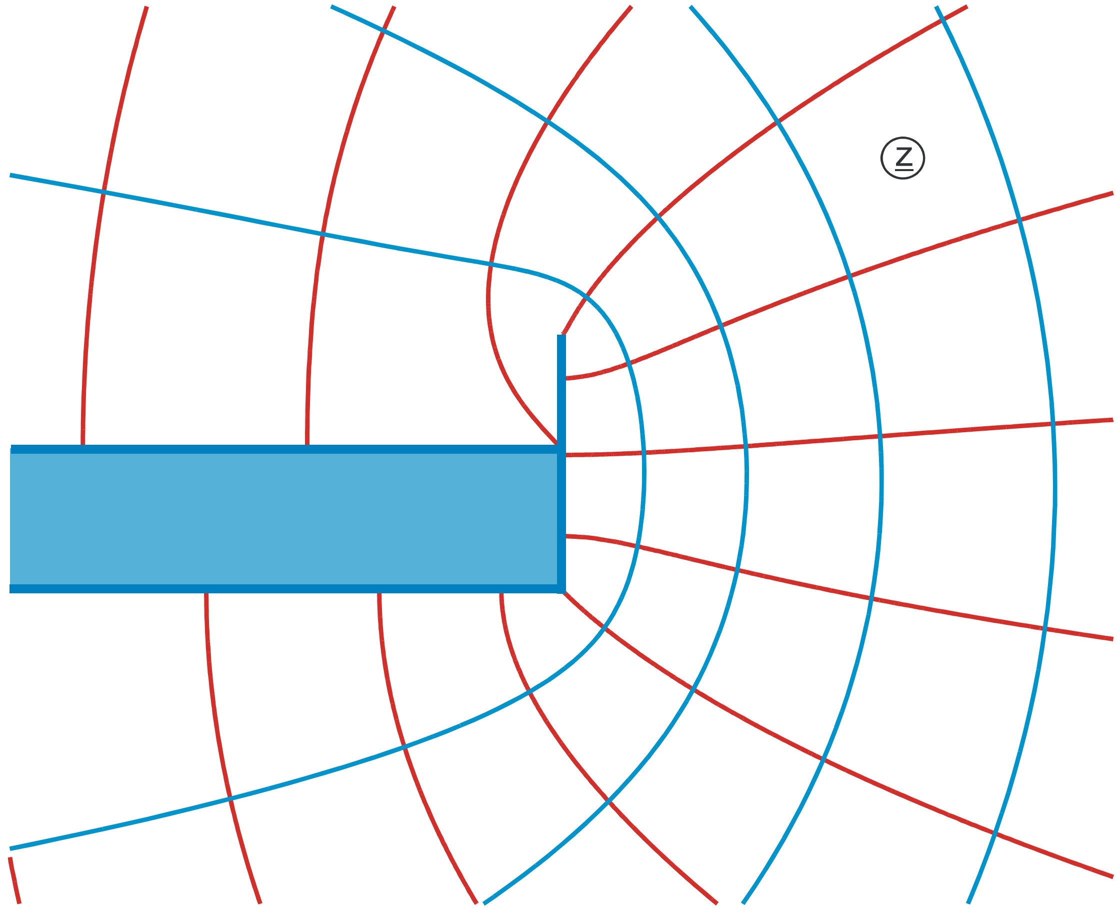
$$z = \ln\left(\sqrt{w} + \sqrt{w-1}\right) - \frac{2w - 1 - 4\lambda}{1 - 4\lambda}\sqrt{w(w-1)}$$

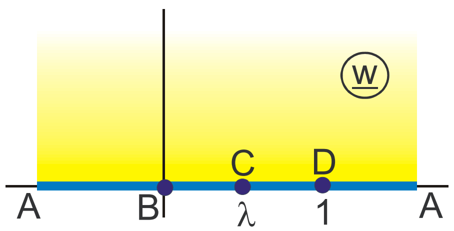
$-7{,}5 \le u \le 7{,}5$ $\qquad$ $0 \le v \le 5$

$\lambda = -1{,}2$ $\qquad$ $\lambda < 0$

$$h = \ln\left(\sqrt{-\lambda} + \sqrt{-\lambda + 1}\right) - \frac{1 + 2\lambda}{1 - 4\lambda}\sqrt{\lambda(\lambda - 1)}$$

$h = 0$ für $\lambda = 0$





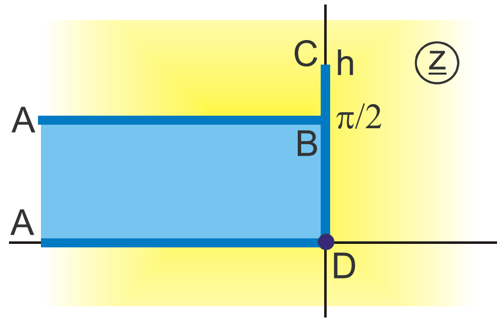


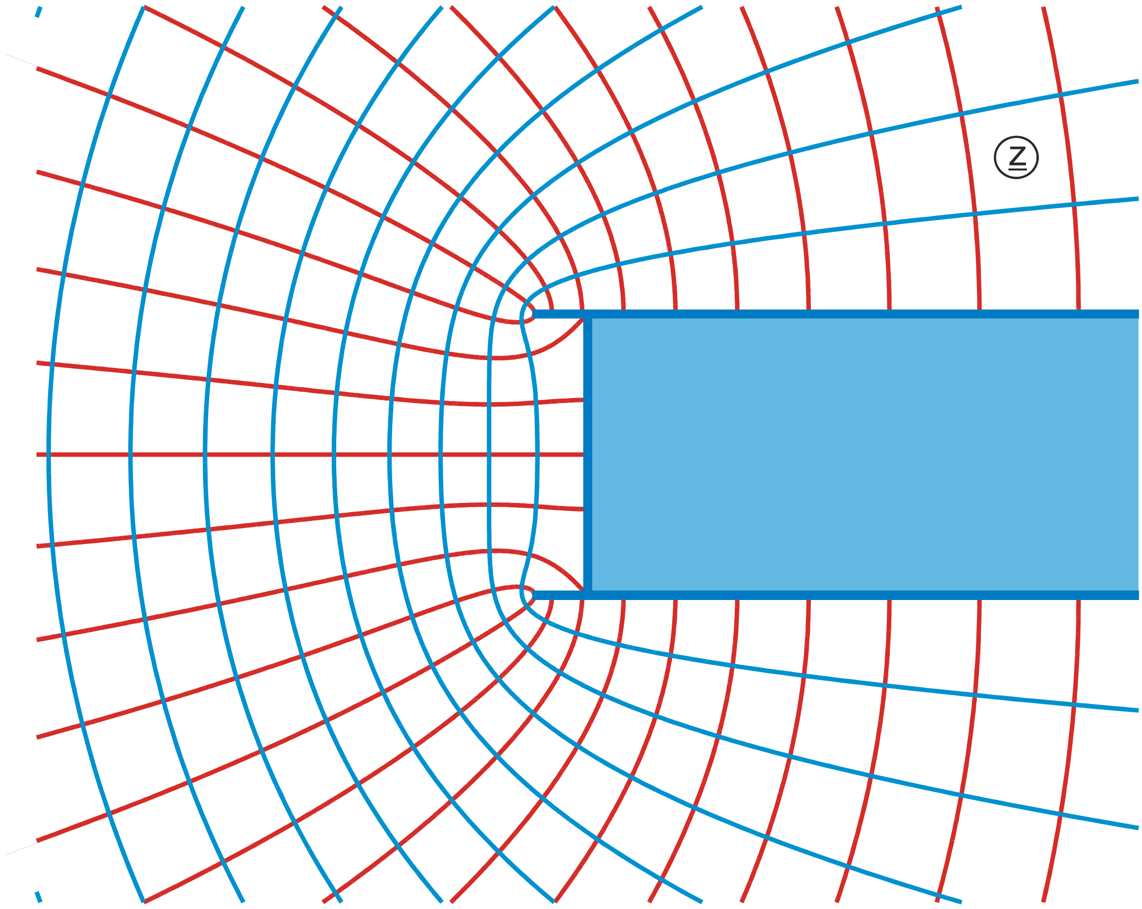
Abbildung A 5.2

$$z = \ln\left(\sqrt{w} + \sqrt{w-1}\right) - \frac{2w-1-4\lambda}{1-4\lambda}\sqrt{w(w-1)}$$

$-2 \le u \le 2$ $\quad$ $0 \le v \le 1$

$\lambda = 0{,}175$ $\quad$ $0 \le \lambda < 0{,}25$

$h = \arccos\sqrt{\lambda} + \frac{1+2\lambda}{1-4\lambda}\sqrt{\lambda(\lambda-1)}$ $\quad$ $h = \pi/2$ für $\lambda = 0$



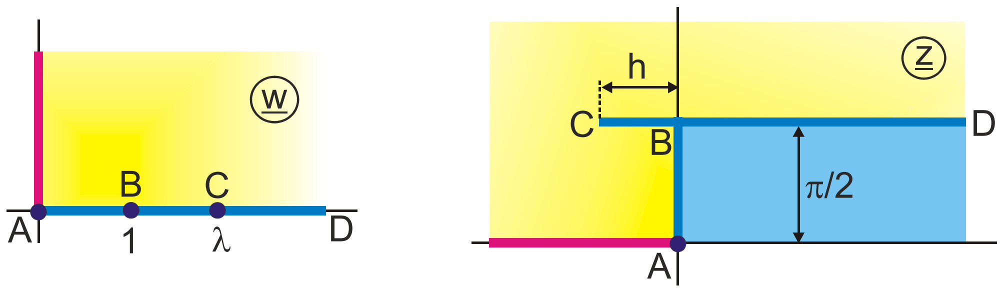


Abbildung A 5.3

$$z = \sigma w\sqrt{w^2 - 1} - \operatorname{ar}\cosh w + j\frac{\pi}{2}$$

$0 \le u \le 10$

$0 \le v \le 5$

$\sigma = 0{,}2$

$\sigma < 1$

$$\lambda = \sqrt{\frac{1+\sigma}{2\sigma}}$$

$$h = \frac{\sqrt{1-\sigma^2}}{2} - \operatorname{ar}\cosh\lambda$$

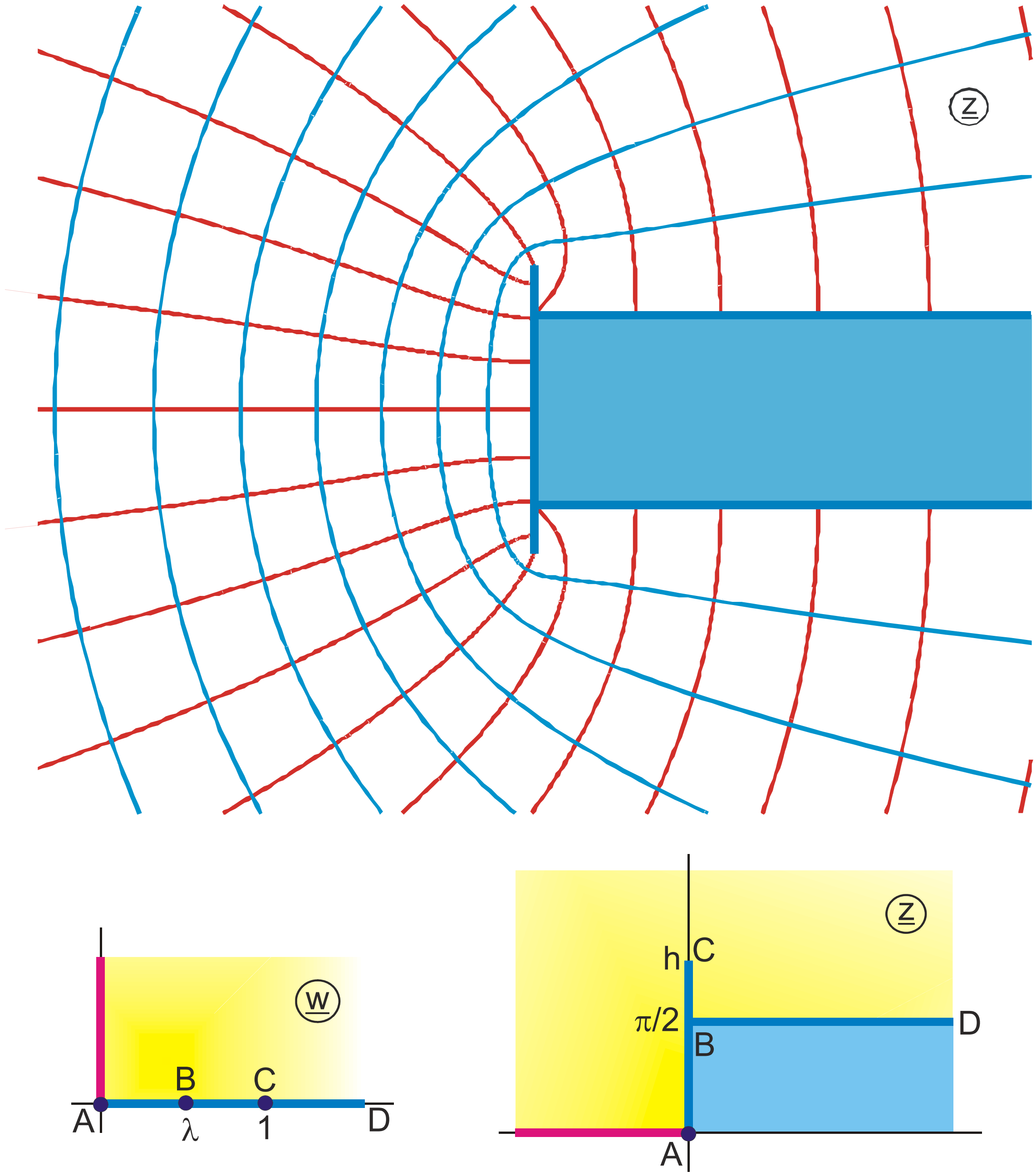


Abbildung A 5.4

$$z = \sigma w \sqrt{w^2 - 1} - \operatorname{ar\,cosh} w + j\frac{\pi}{2}$$

$0 \le u \le 4$

$0 \le v \le 2$

$\sigma = 3$

$\sigma > 1$

$$\lambda = \sqrt{\frac{1+\sigma}{2\sigma}}$$

$$h = \frac{\sqrt{\sigma^2 - 1}}{2} - \arccos \lambda$$

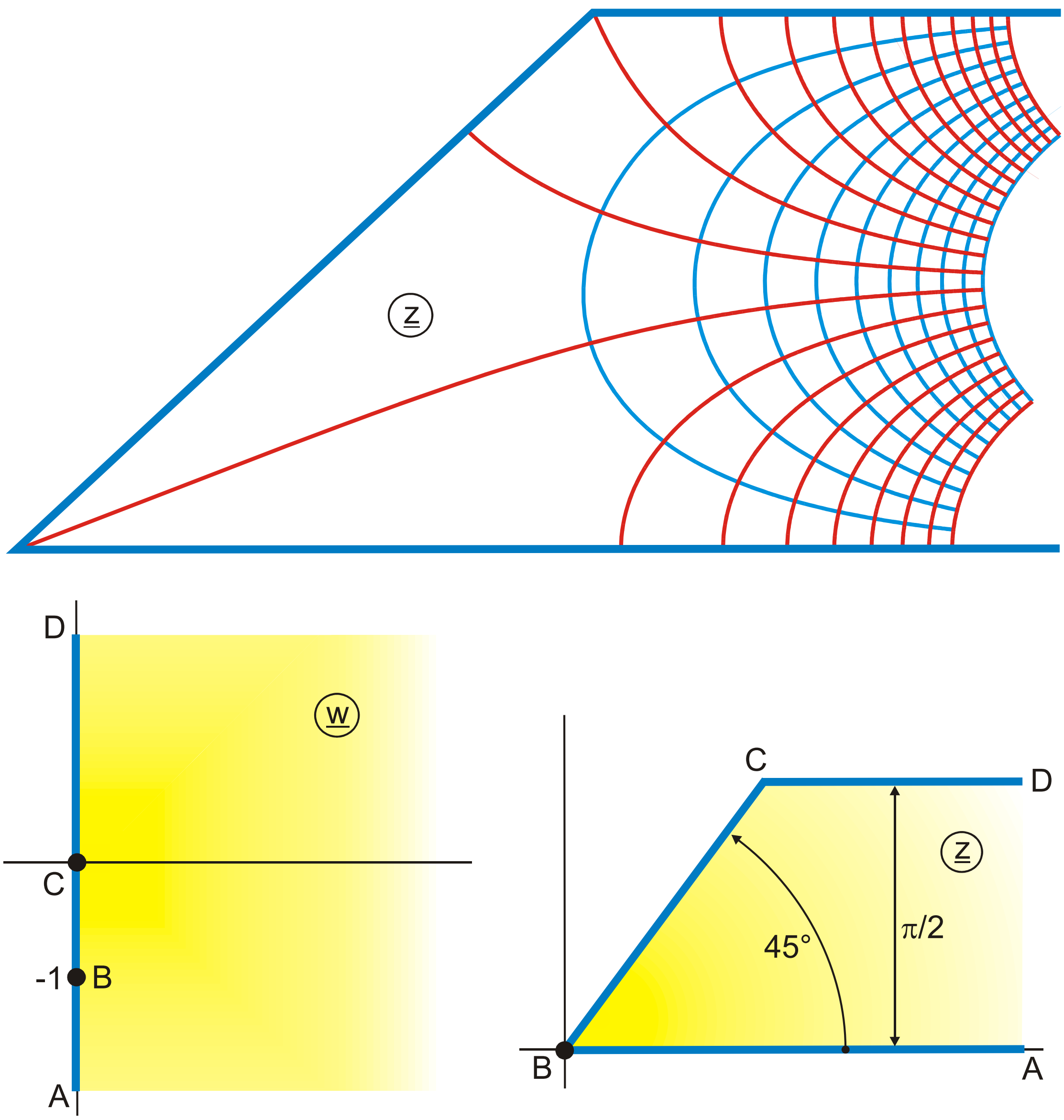


Abbildung A 5.5

$$z = \operatorname{ar\,tanh} w_1 + \arctan w_1$$

$$w_1 = \left(1 + j/w\right)^{1/4}$$

$0 \leq u \leq 10$

$-10 \leq v \leq 10$

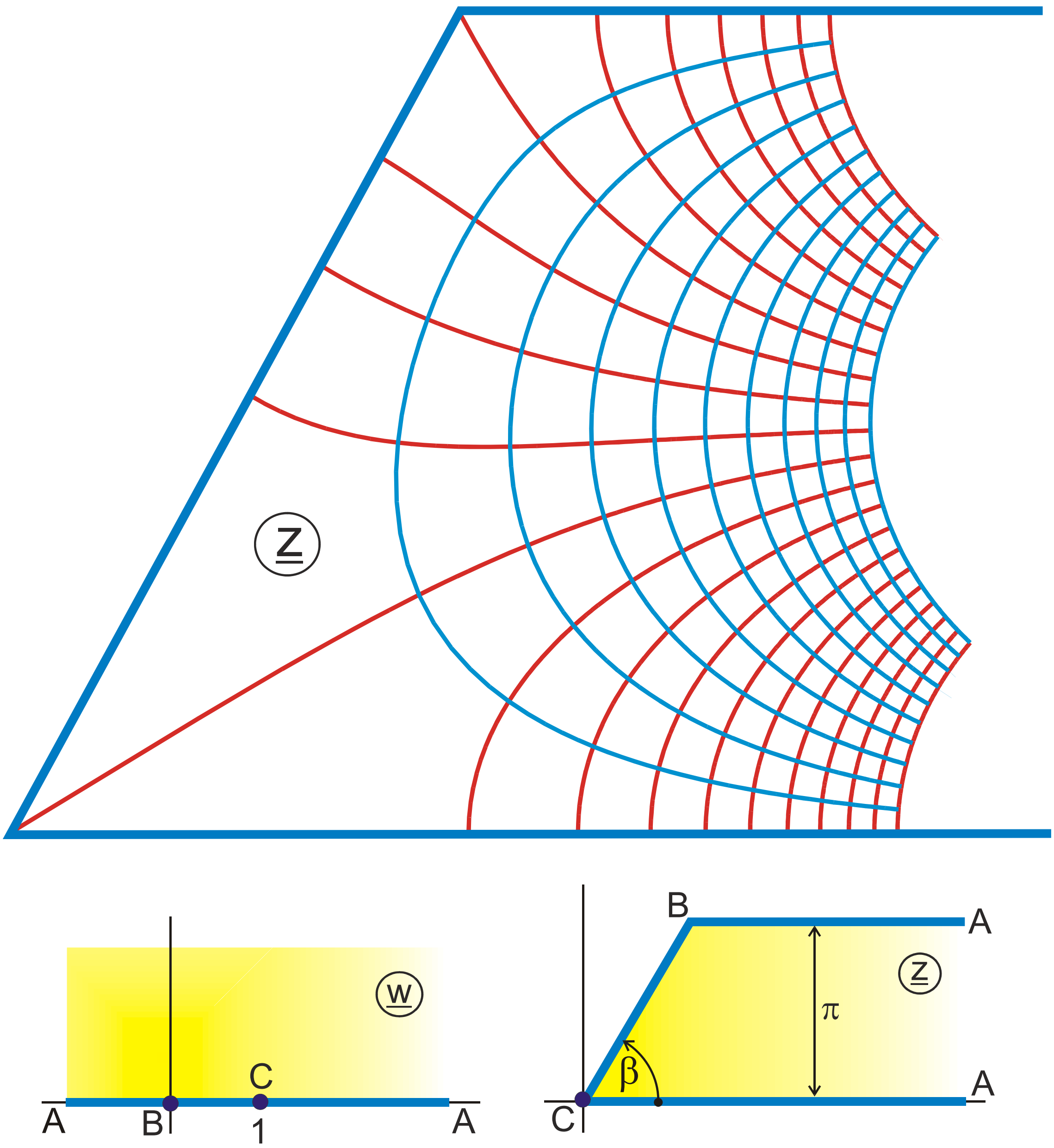


Abbildung A 5.6

$$z = \sum_{i=0}^{q-1}\left[-t^{p}\ln\left(1-\frac{w_1}{t}\right)\right]$$

$$w_1 = \left(1 - 1/w\right)^{1/q} \qquad t(i) = \exp\left(\frac{j2\pi i}{q}\right)$$

$-1{,}5 \le u \le 3{,}5$ $\qquad$ $0 \le v \le 2{,}5$

p, q: >0 und ganzzahlig $\qquad$ $\beta = \pi\, p/q$

$p = 1$ $\qquad$ $q = 3$

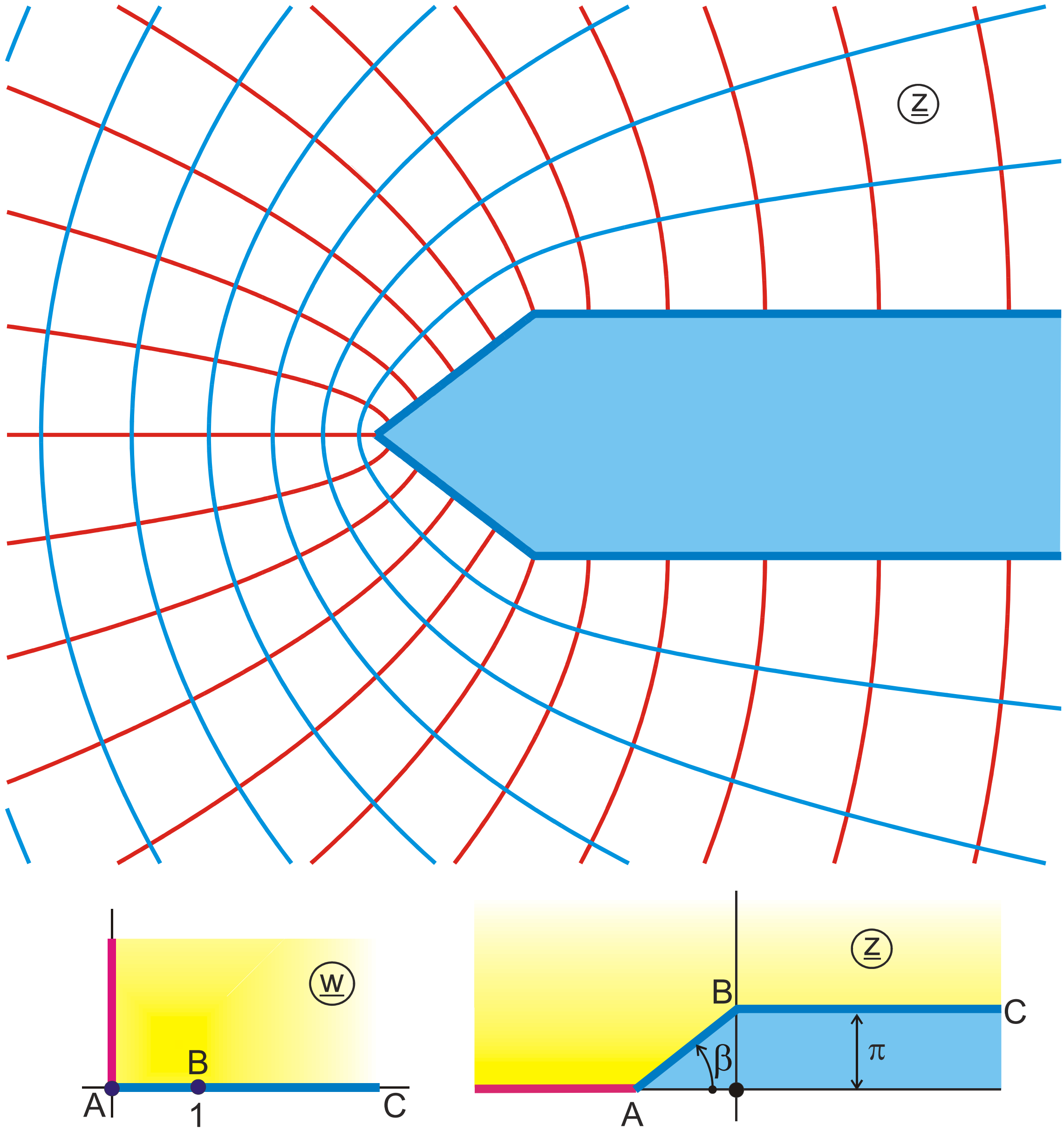


Abbildung A 5.7

$$z = \sum_{i=0}^{q-1}\left[w_i^{\,p} \ln\left(1-\frac{w_2}{w_i}\right)\right] - \frac{q\, w_2^{\,p}}{p(w_2^{\,q}-1)} + j\pi$$

$$w_2 = \left(1-1/w_1\right)^{1/q}$$

$$w_i(i) = \exp\left(\frac{j2\pi i}{q}\right)$$

$w_1 = w^2$

p, q: >0 und ganzzahlig

$0 \le u \le 3$

$0 \le v \le 2$

$\beta = \pi\, p/q$

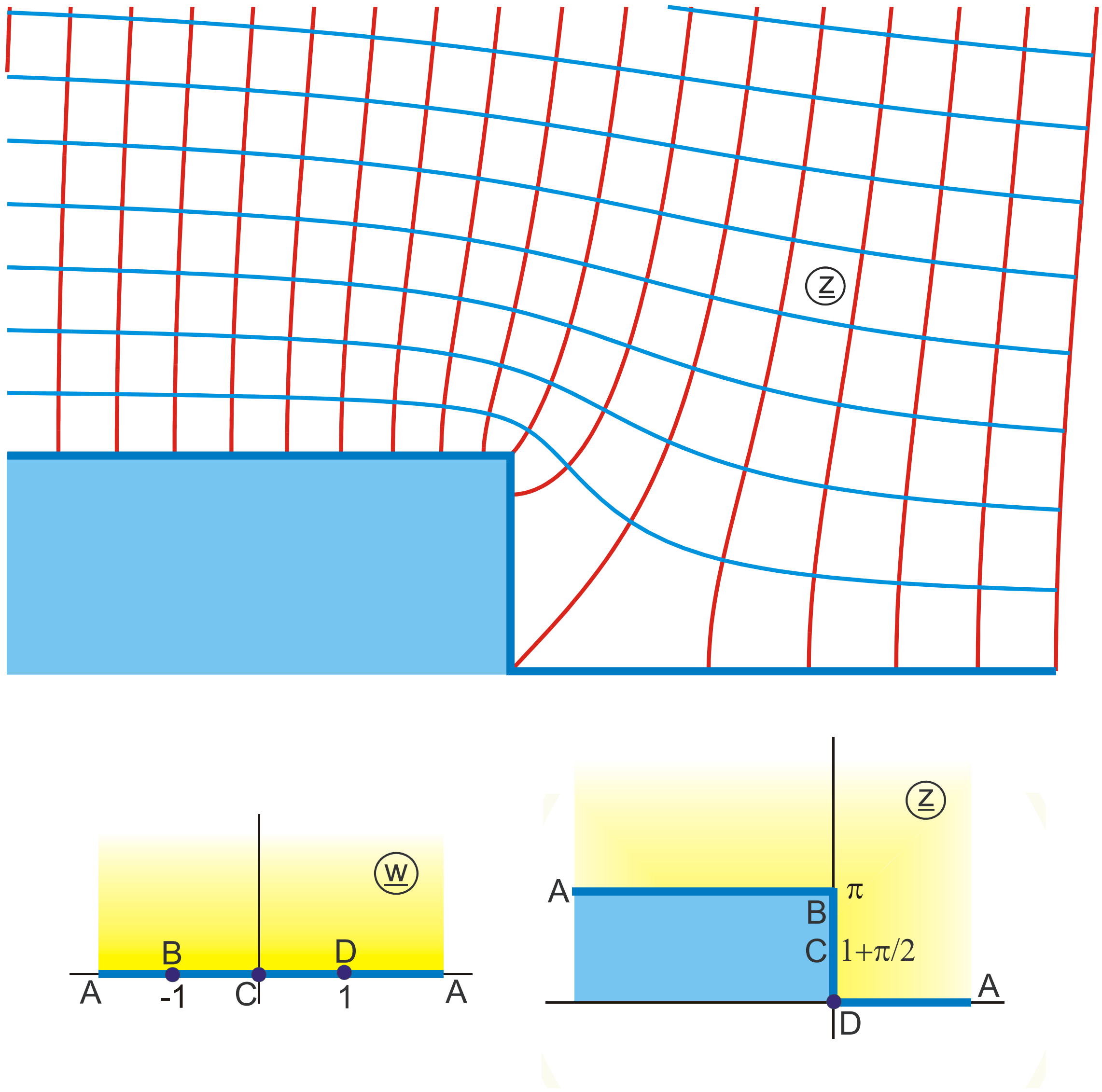
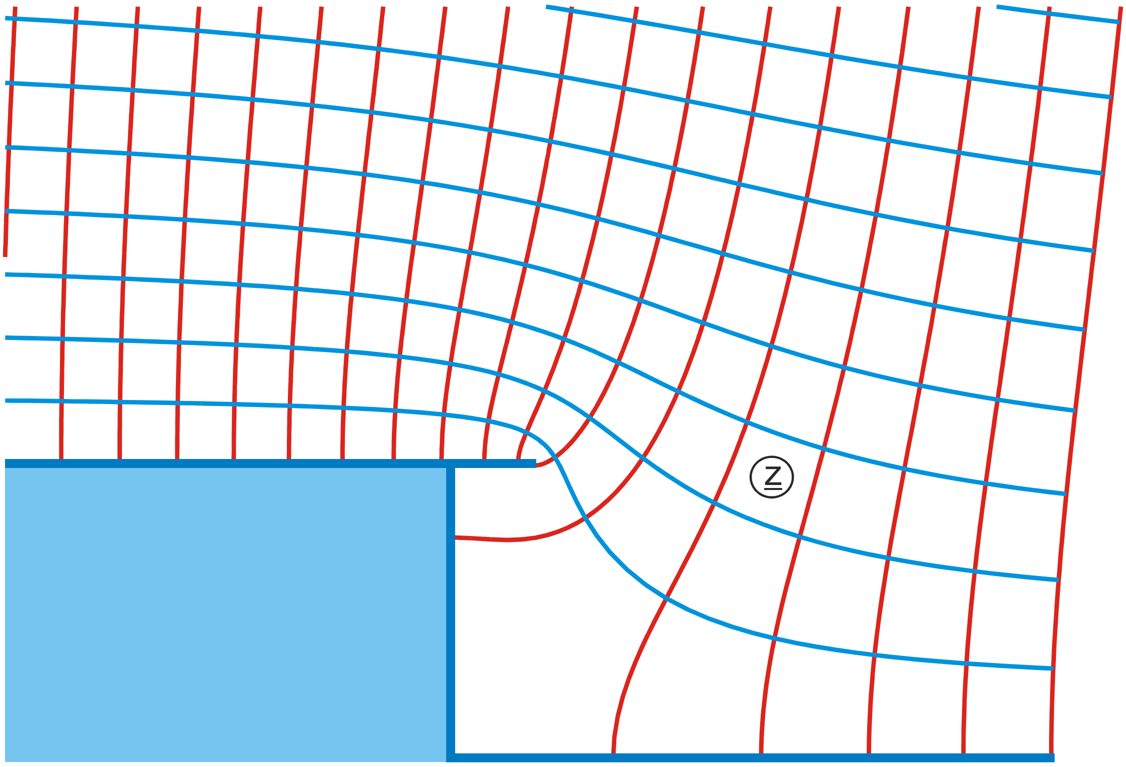


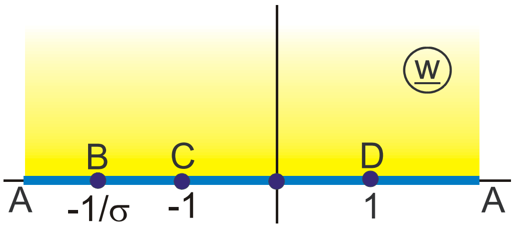
Abbildung A 6

$$z = \operatorname{ar\,cosh} w + \sqrt{w^2 - 1}$$

$-14 \le u \le 6$

$0 \le v \le 10$





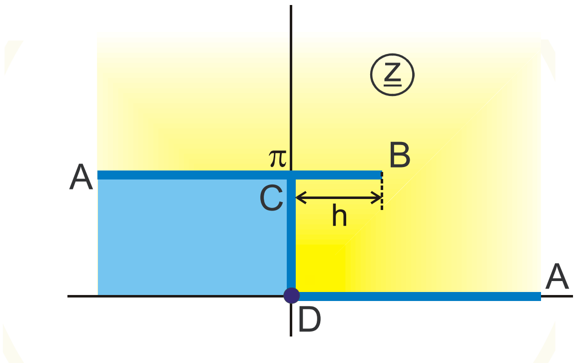


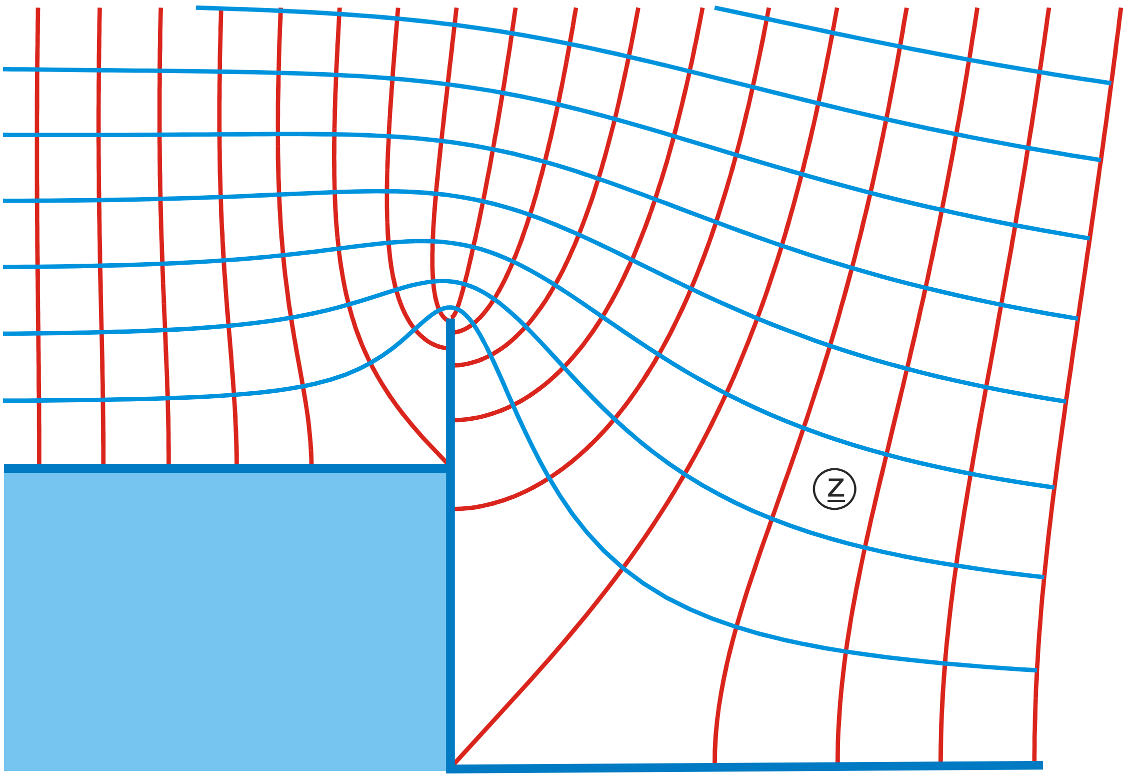
Abbildung A 6.1

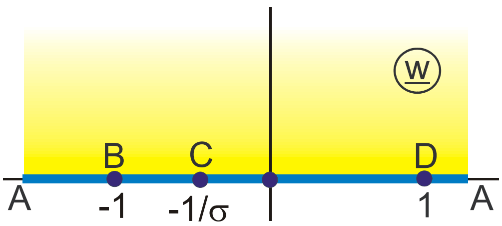
$z = \operatorname{ar\,cosh} w + \sigma\sqrt{w^2 - 1}$

$0 < \sigma \leq 1$

$-38 \leq u \leq 12$ $0 \leq v \leq 25$

$h = \ln\left(\frac{1}{\sigma} + \sqrt{\frac{1}{\sigma^2} - 1}\right) - \sigma\sqrt{\frac{1}{\sigma^2} - 1}$ $h = 0$ für $\sigma = 1$





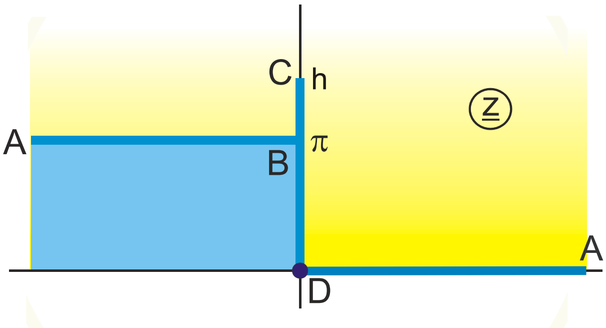


Abbildung A 6.2

$z = \operatorname{ar}\cosh w + \sigma\sqrt{w^2 - 1}$

$\sigma = 3$ $\sigma \geq 1$

$-3 \leq u \leq 2$ $0 \leq v \leq 2{,}5$

$h = \arccos\left(-\frac{1}{\sigma}\right) + \sigma\sqrt{1 - \frac{1}{\sigma^2}}$

$h = \pi$ für $\sigma = 1$

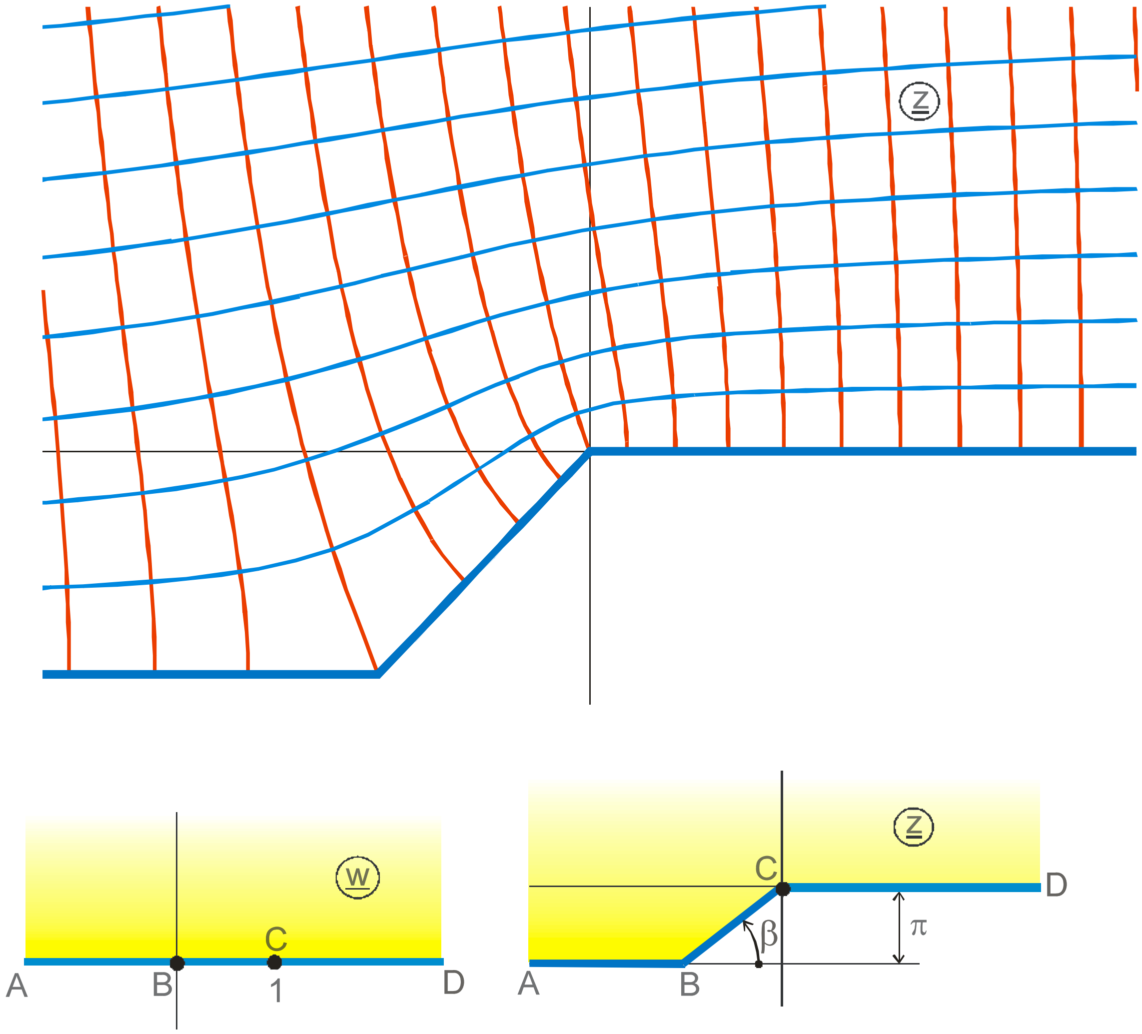


Abbildung A 6.3

$$z = \sum_{i=0}^{q-1}\left[w_i^{\,p} \ln\left(1 - \frac{w_1}{w_i}\right)\right] - \frac{q\, w_1^{\,p}}{p(w_1^{\,q} - 1)}$$

$w_1 = \left(1 - 1/w\right)^{1/q}$

$w_i(i) = \exp\left(\frac{j2\pi i}{q}\right)$

$0 < \beta \le \pi$

p, q: >0 und ganzzahlig

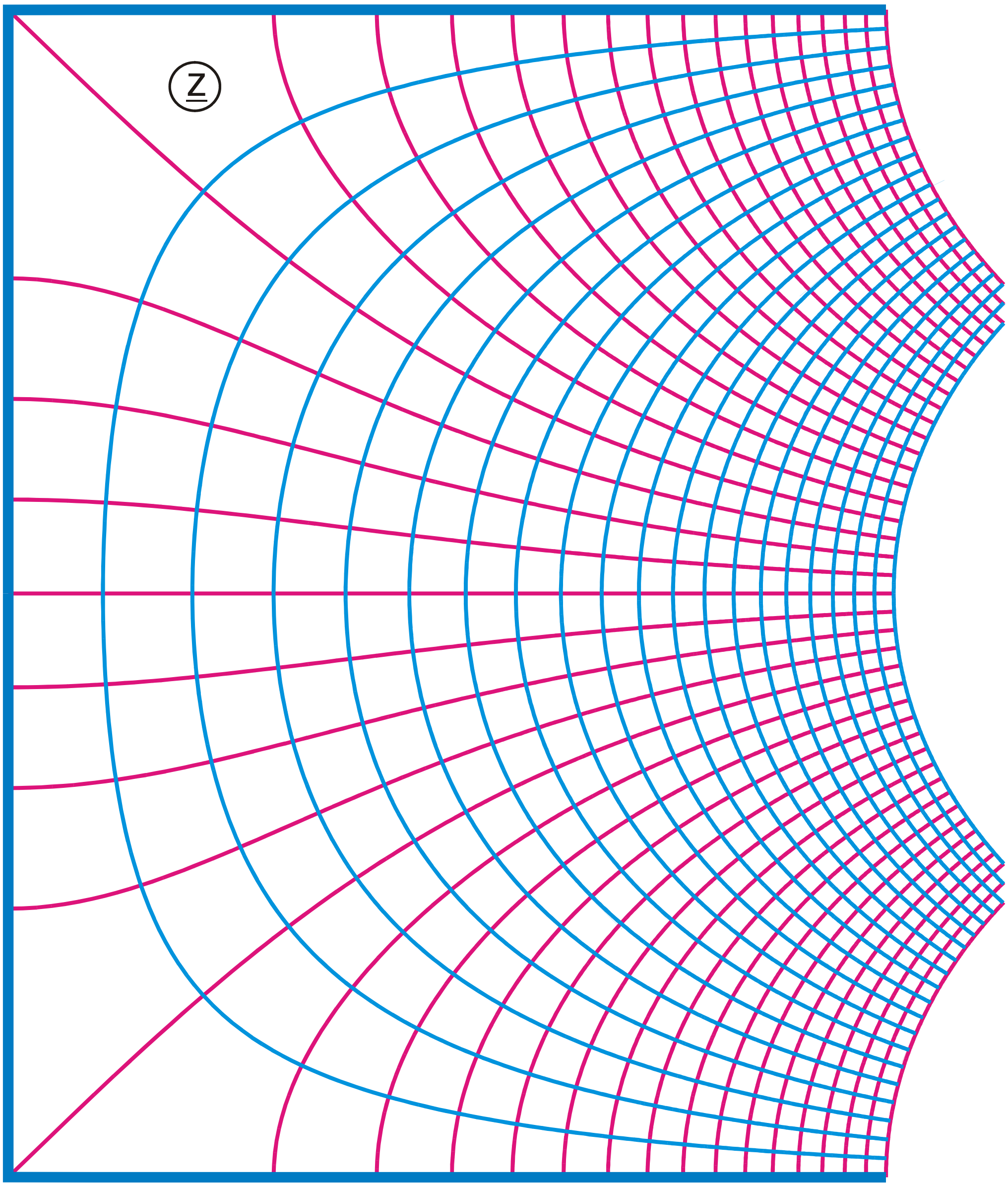
$-1{,}5 \le u \le 3{,}5$

$0 \le v \le 2{,}5$

$\beta = \pi\, p/q$

$p = 1$

$q = 4$



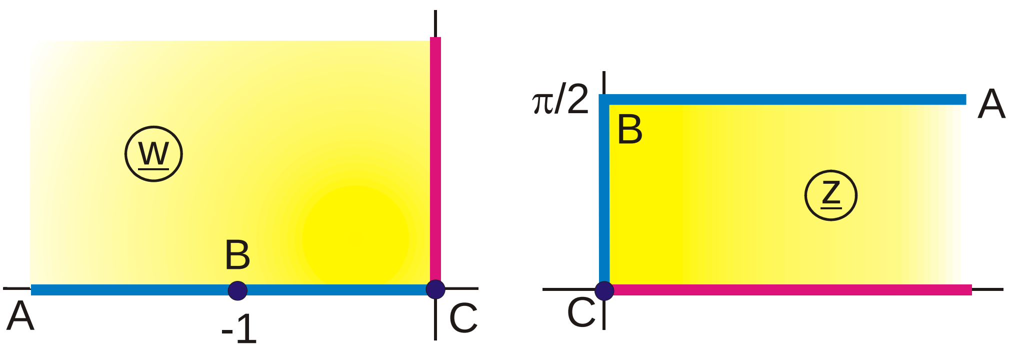


Abbildung A 7

z = arcosh (w) - j π/2

-5 ≤ u ≤ 0 0 ≤ v ≤ 5

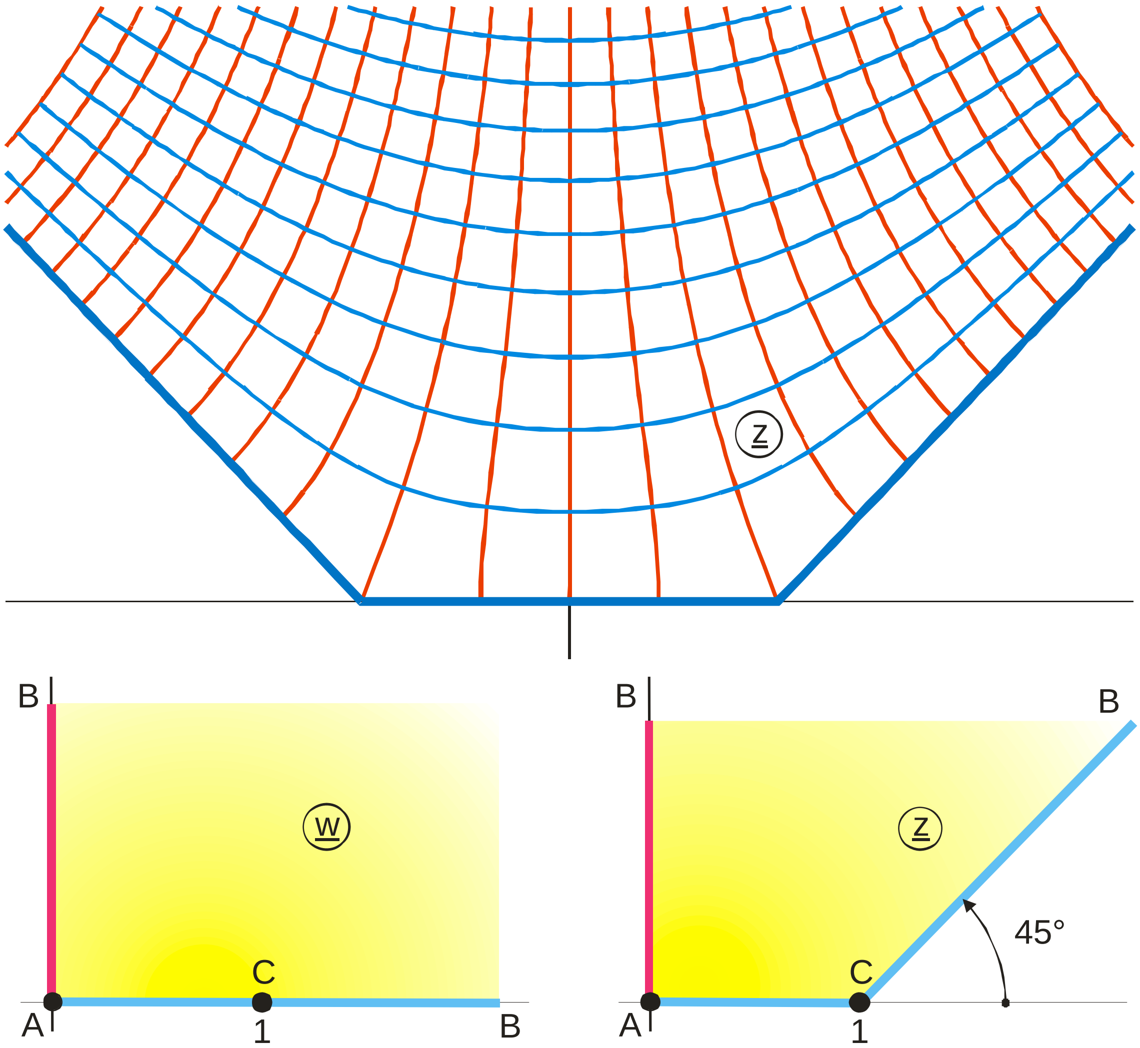


Abbildung A 7.1

$$z = \frac{1}{a} B_a(w_1, k)$$

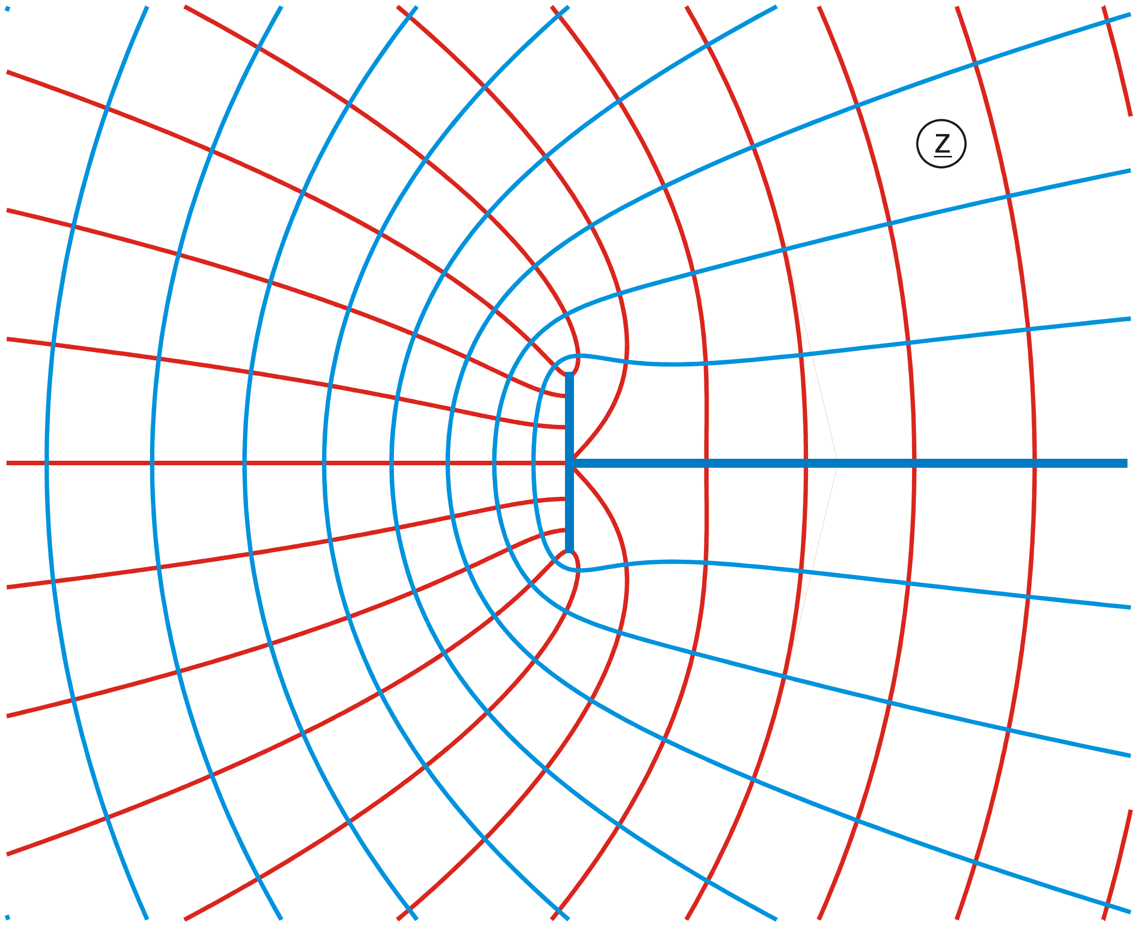
$$w_1 = \sqrt{1 + j\sqrt{w^2 - 1}}$$

$$k = 1/\sqrt{2}$$

a = 2E(k)-K(k)

$0 \leq u \leq 6$

$0 \leq v \leq 6$



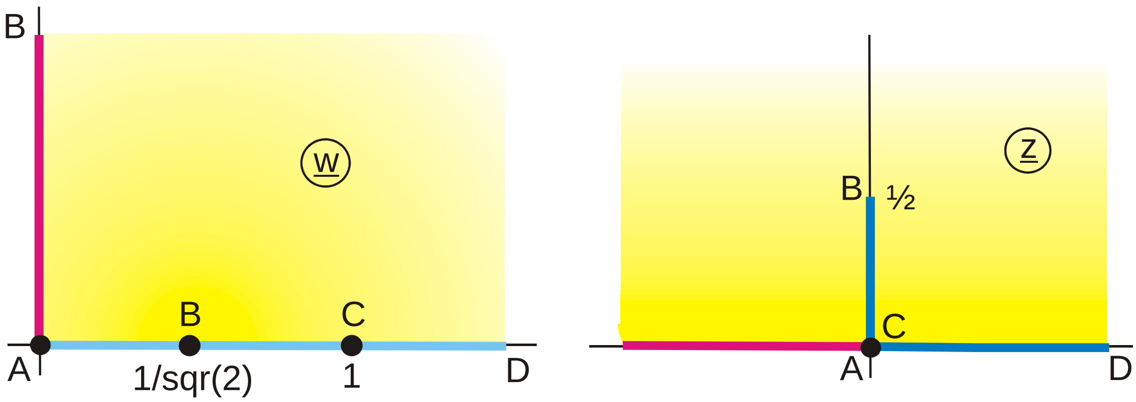
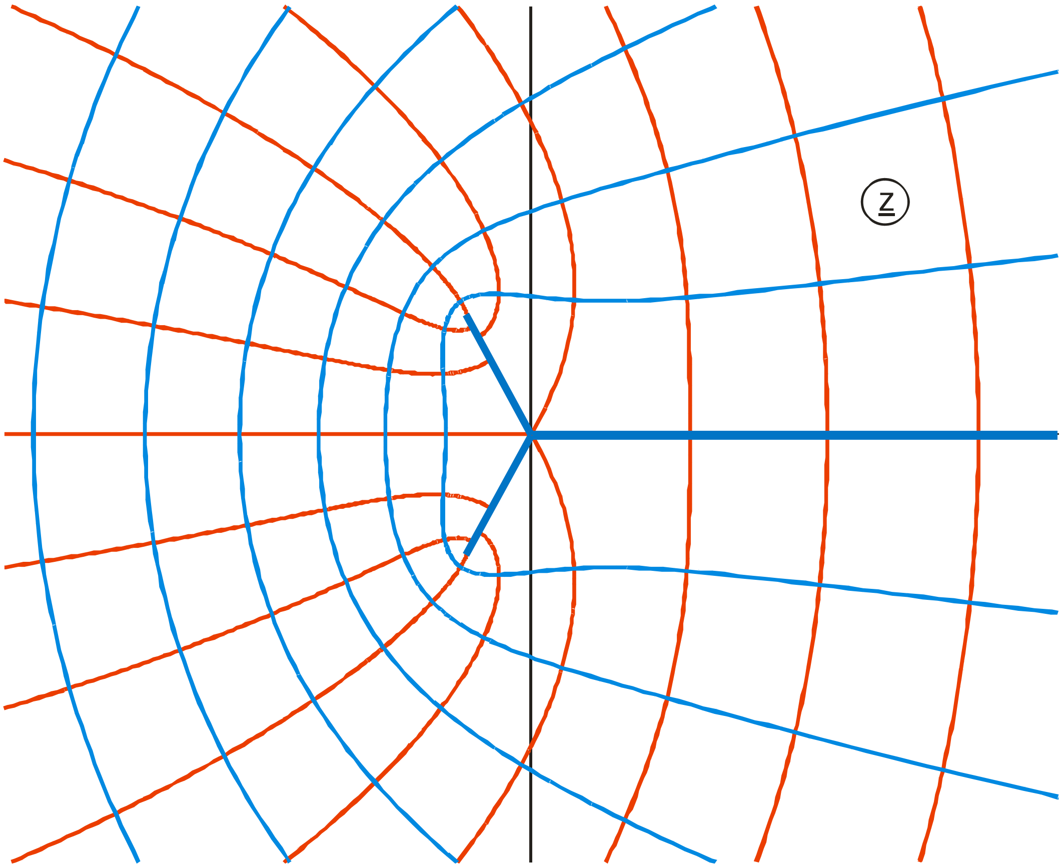
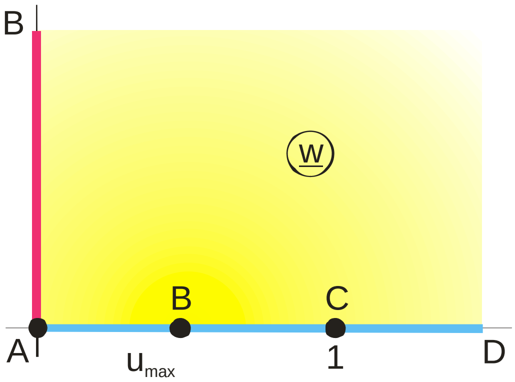


Abbildung A 8

$z = w\sqrt{w^2 - 1}$

$0 \le u \le 4$ $0 \le v \le 2$





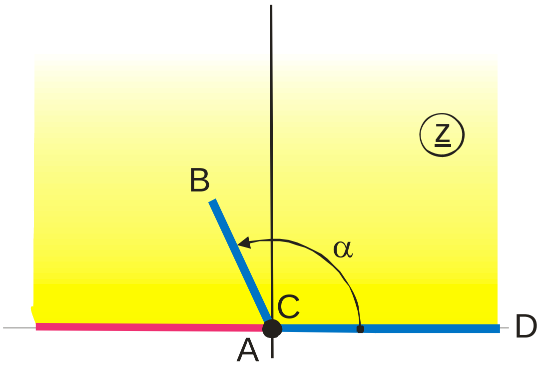


Abbildung A 8.1

$$z = w^2 \left(w - \frac{1}{w} \right)^{\alpha / \pi}$$

$0 \le u \le 4$

$0 \le v \le 2$

$u_{max} = \sqrt{1 - \alpha / \pi}$

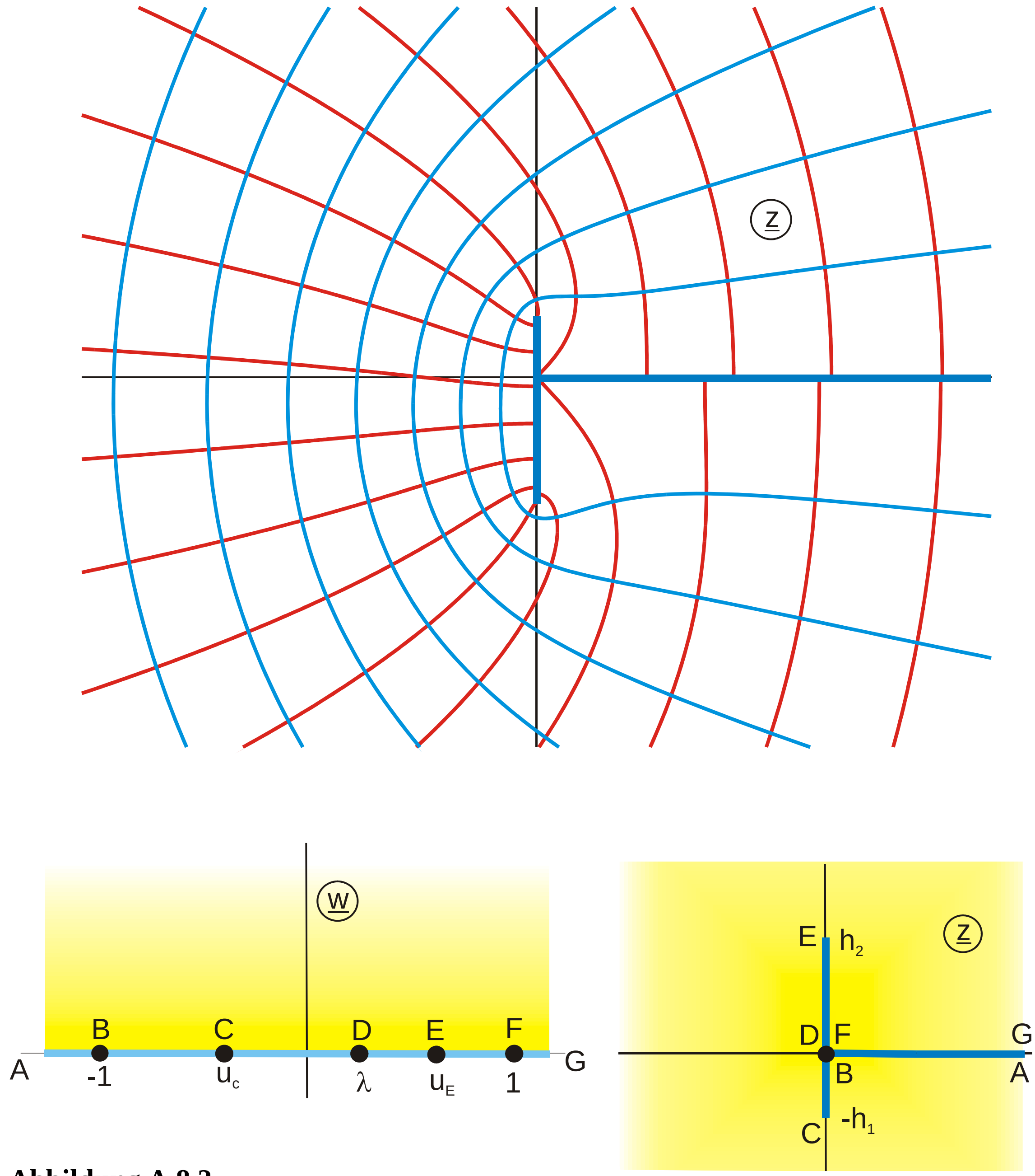


Abbildung A 8.2

$$z = (w - \lambda)\sqrt{w^2 - 1}$$

$-2 \le u \le 2$

$0 \le v \le 2$

$$u_C = \left(\lambda - \sqrt{\lambda^2 + 8}\right)/4$$

$$u_E = \left(\lambda + \sqrt{\lambda^2 + 8}\right)/4$$

$$h_1 = (u_C - \lambda)\sqrt{u_C^{\,2} - 1}$$

$$h_2 = (u_E - \lambda)\sqrt{u_E^{\,2} - 1}$$

$\lambda = 0{,}25$

$0 \le \lambda \le 1$

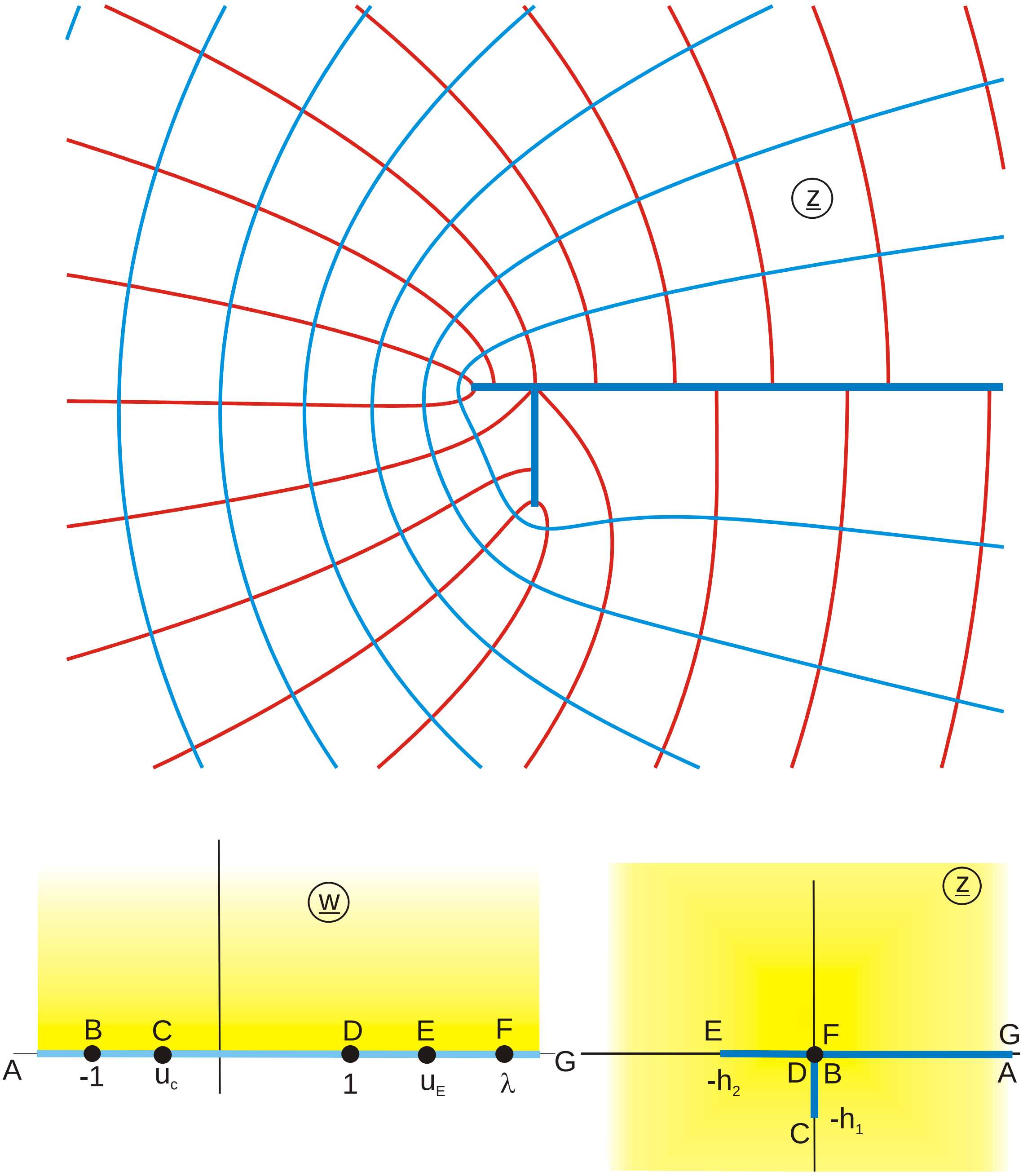


Abbildung A 8.3

$z = (w - \lambda)\sqrt{w^2 - 1}$

$-2 \le u \le 2$ $\qquad$ $0 \le v \le 2$

$u_C = \left(\lambda - \sqrt{\lambda^2 + 8}\right)/4$ $\qquad$ $u_E = \left(\lambda + \sqrt{\lambda^2 + 8}\right)/4$

$h_1 = (u_C - \lambda)\sqrt{{u_C}^2 - 1}$ $\qquad$ $h_2 = (u_E - \lambda)\sqrt{1 - {u_E}^2}$

$\lambda > 1$

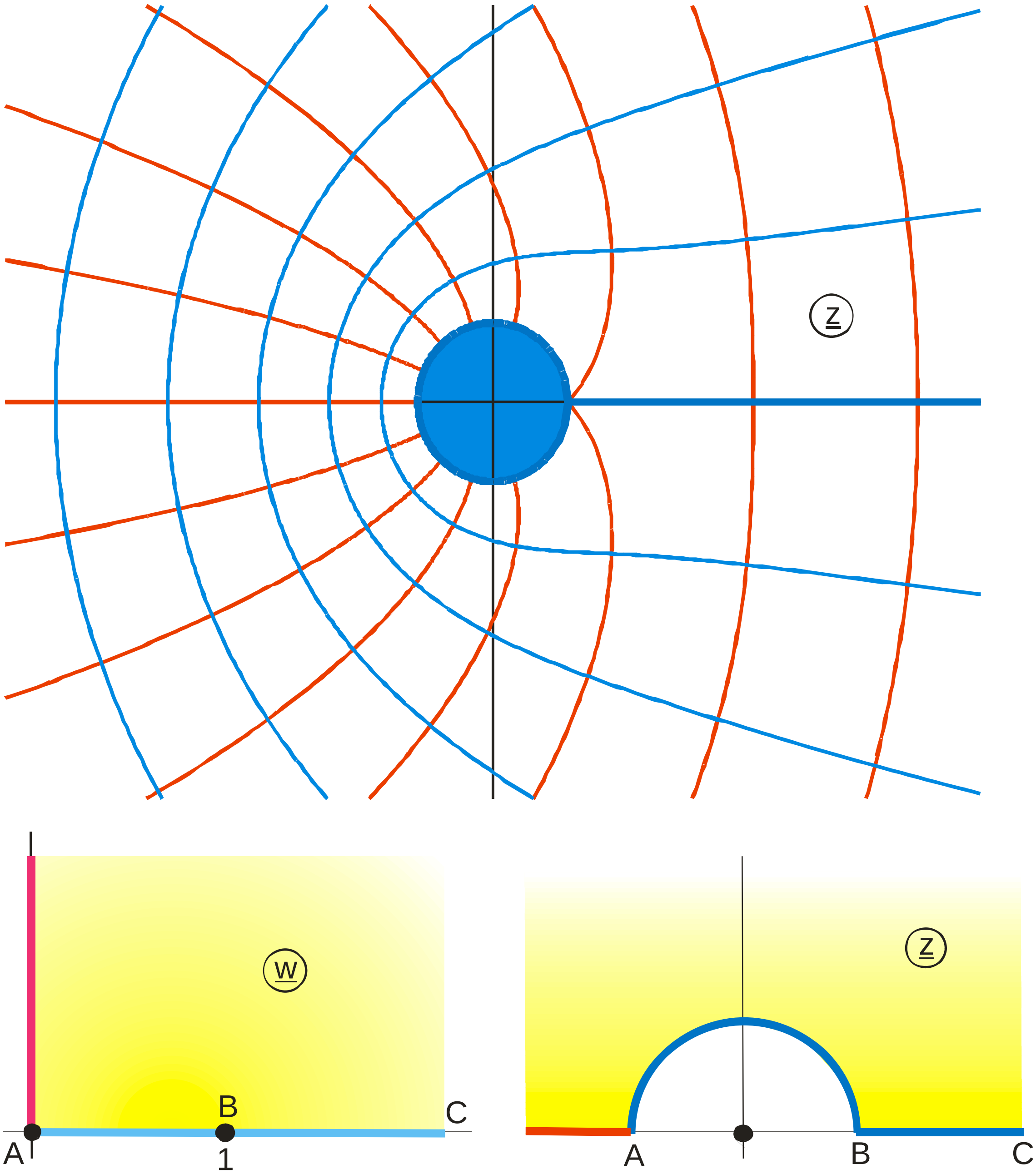
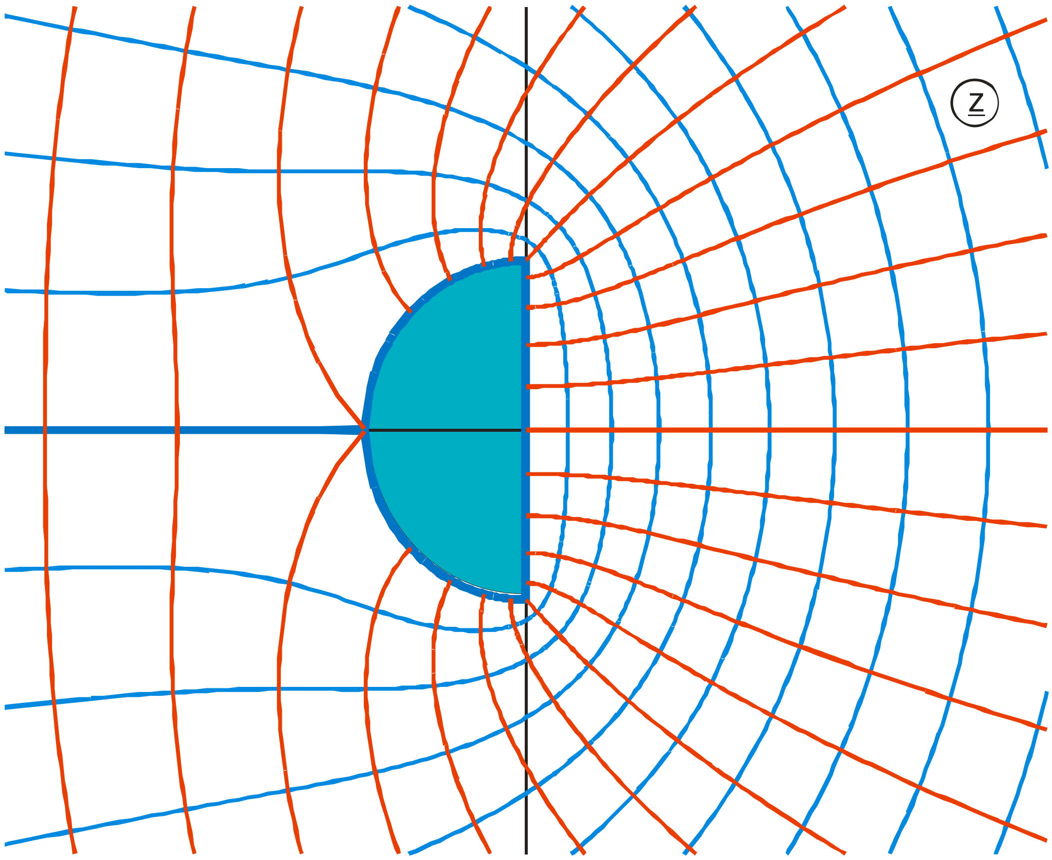


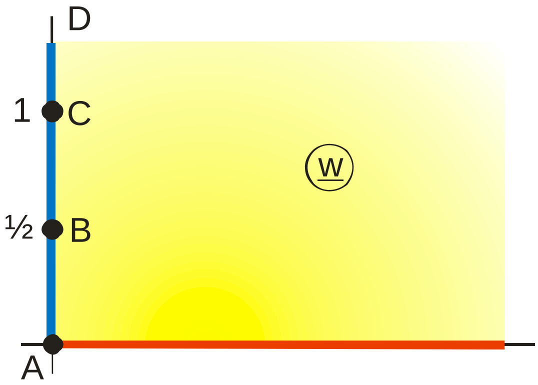
Abbildung A 9

$$z = w\left(w + \sqrt{w^2 - 1}\right) - 1/2$$

$-1 \leq u \leq 0$

$0 \leq v \leq 1$





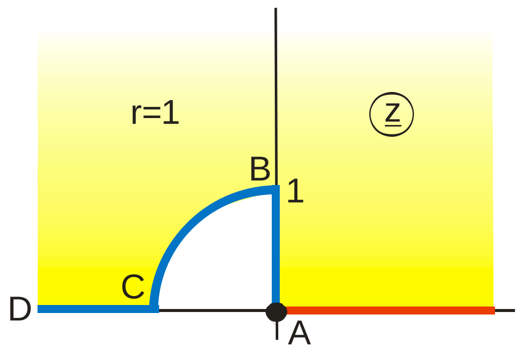


Abbildung A 9.1

$$z = \exp(2w_2)$$

$$w_2 = \operatorname{ar\,cosh}\left(\frac{w_1}{a}\right) + \frac{1}{4}\operatorname{ar\,cosh}\left(\frac{5w_1^{\,2}/3-1}{w_1^{\,2}-1}\right)$$

$$w_1 = \sqrt{w^2-1}$$

$0 \le u \le 2$ $0 \le v \le 2$

$$a = \sqrt{3/4}$$

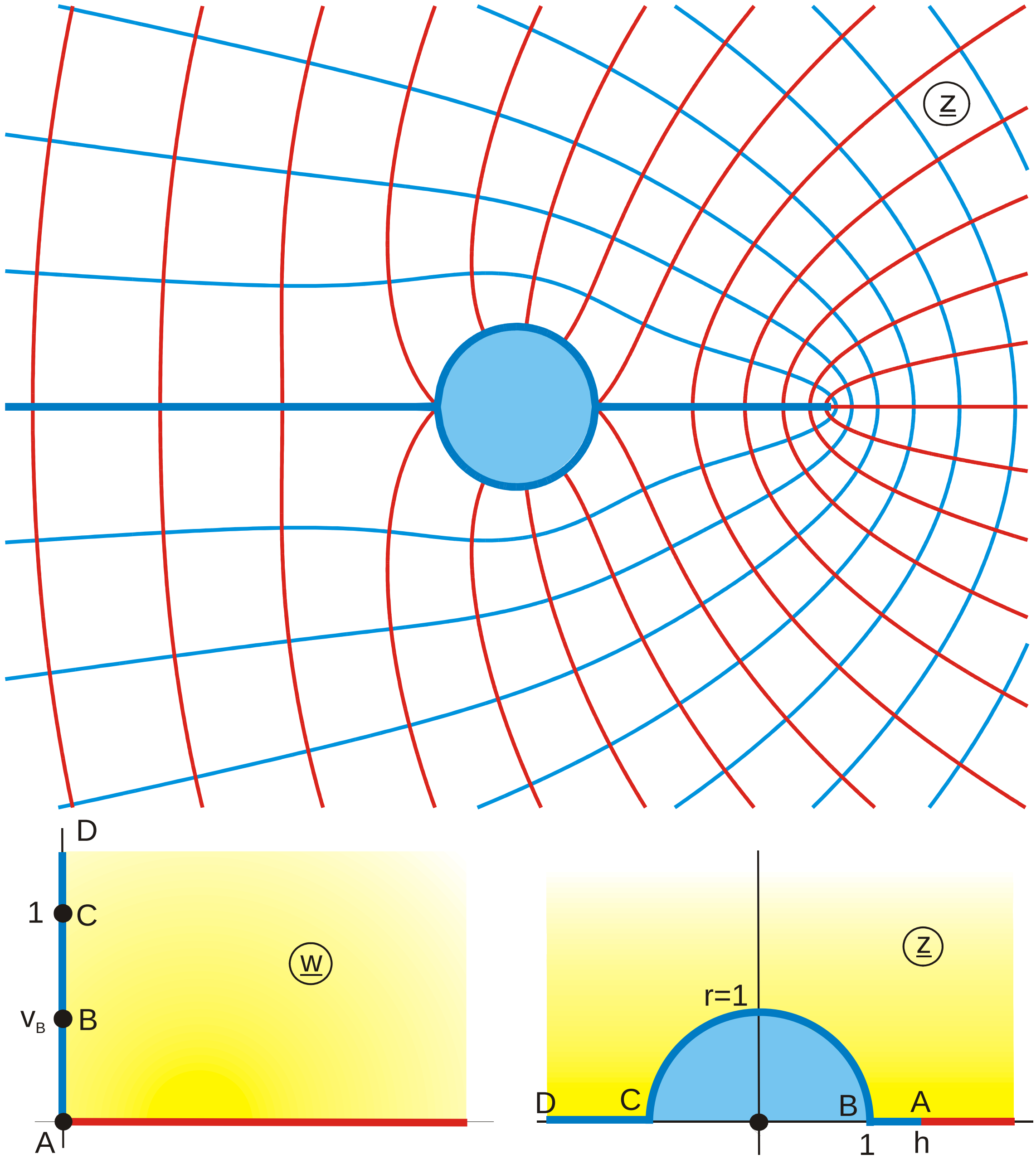


Abbildung A 9.2

$$z = \left(w_1 + \sqrt{w_1^2 - 1}\right)^2$$

$$w_1 = \sigma\sqrt{w^2 + 1}$$

$0 \le u \le 1$ $\qquad$ $0 \le v \le 2$

$v_B = \sqrt{1 - 1/\sigma^2}$ $\qquad$ $h = \exp\{2 \operatorname{arcosh}(\sigma)\}$

$\sigma = 1{,}25$ $\qquad$ $h = 4$

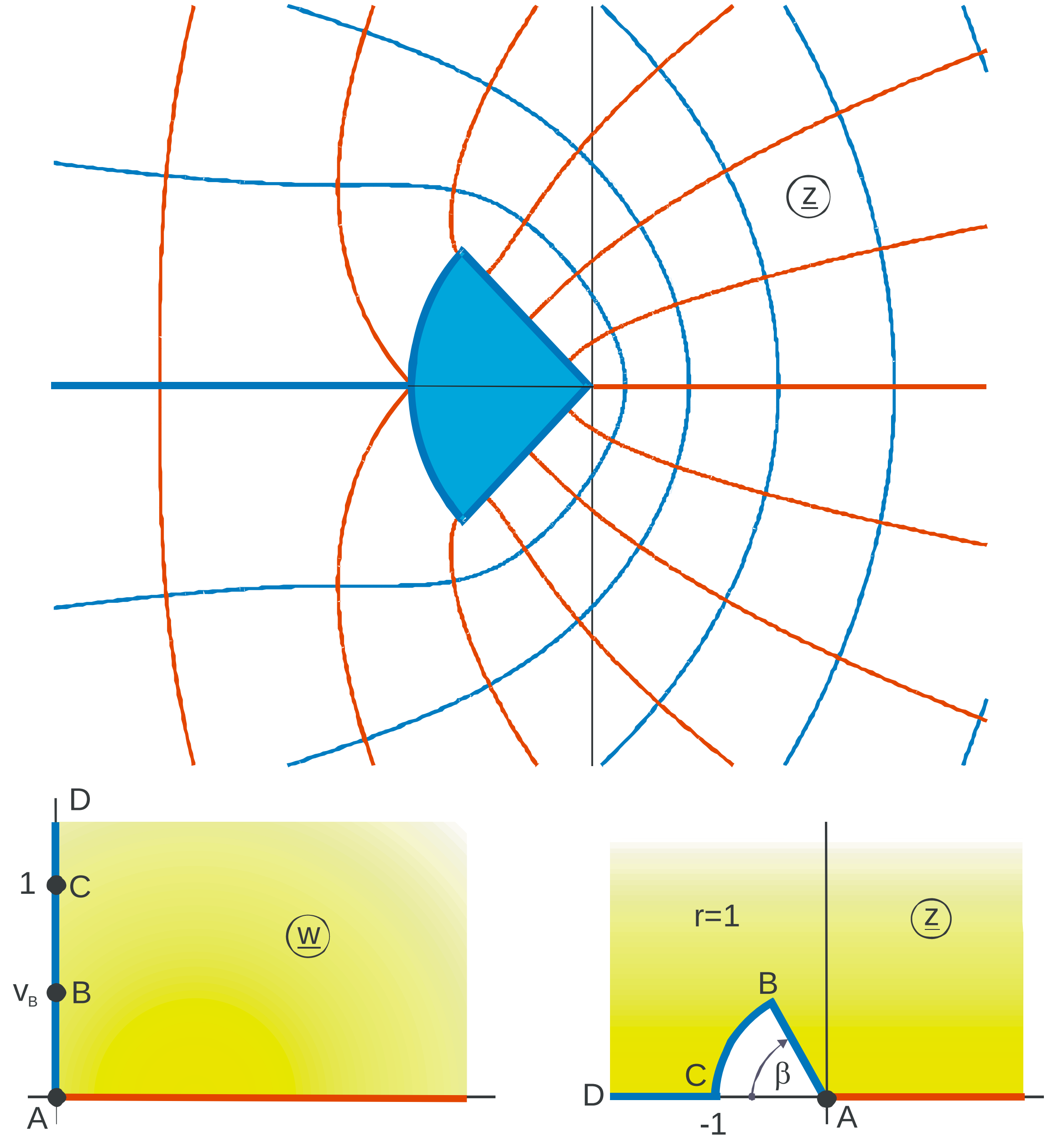


Abbildung A 9.3

$z = \exp(2w_2)$

$$w_2 = \operatorname{ar\,cosh}\left(\frac{w_1}{a}\right) + b \operatorname{ar\,cosh}\left(\frac{w_1^{\,2}c - a^2}{a^2 w_1^{\,2}}\right)$$

$w_1 = \sqrt{w^2 + 1}$

$v_B = \sqrt{1 - a^2}$

$0 \le u \le 2$

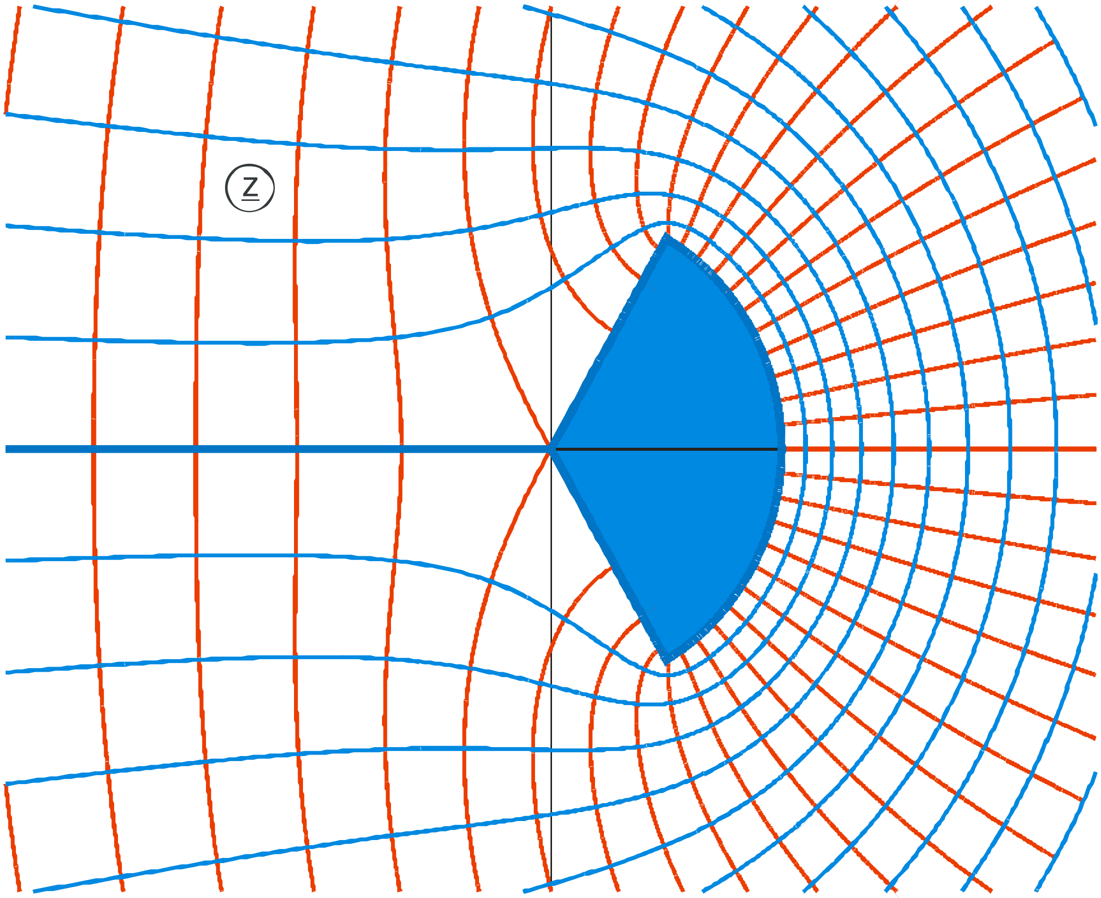
$0 \le v \le 2$

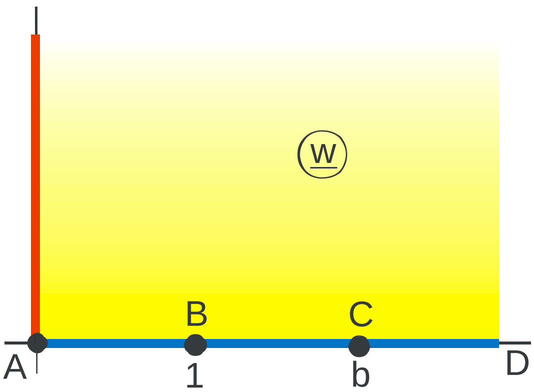
$a = \sqrt{1 - (1 - \beta/\pi)^2}$

$b = \sqrt{1 - a^2}\,/\,2$

$c = 2 - a^2$

$0 \le a \le 1$





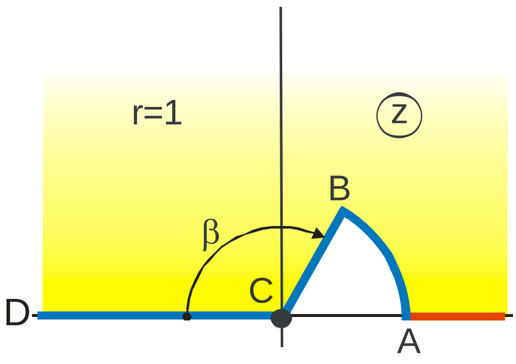
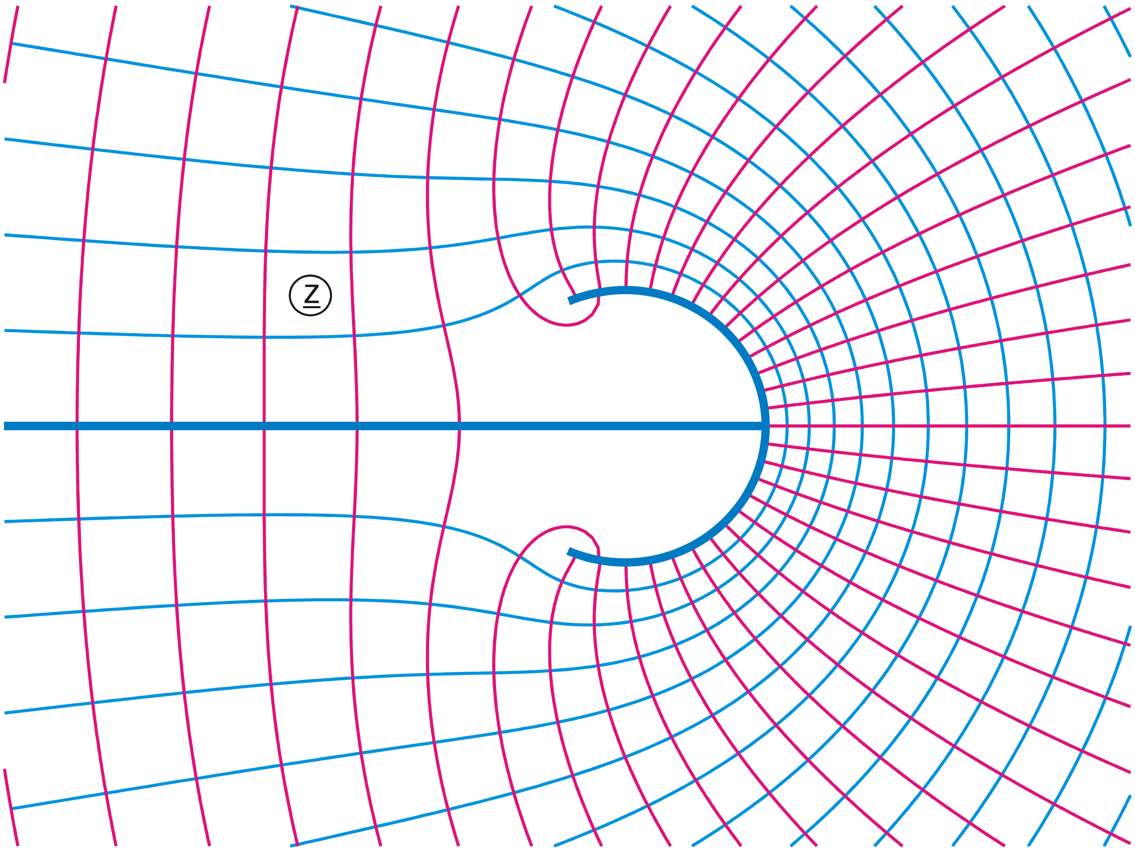


Abbildung A 9.4

$$z = \left(\left(\frac{w_1 + 1}{w_1 - 1} \right) \left(\frac{bw_1 - 1}{bw_1 + 1} \right) \right)^{1/b}$$

$$w_1 = \sqrt{\frac{1 - b^2 + w^2}{w^2}}$$

$\beta = \pi / b$



Kreisbogen, Radius r, Endpunkt auf der y-Achse

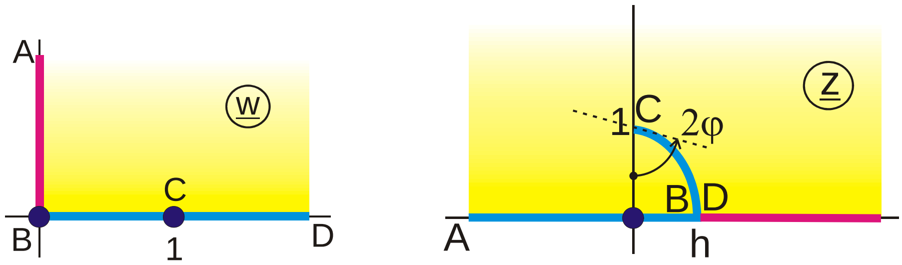


Abbildung A 9.5

$z = -j(w_2 + 1/w_2)/2$

$w_2 = \dfrac{w_1 + j\sin\varphi}{\cos\varphi}$

$w_1 = j(w_0 + \sqrt{w_0^{\,2} - 1})$

$w_0 = w^2 + 1$

$0 < \varphi < \pi$

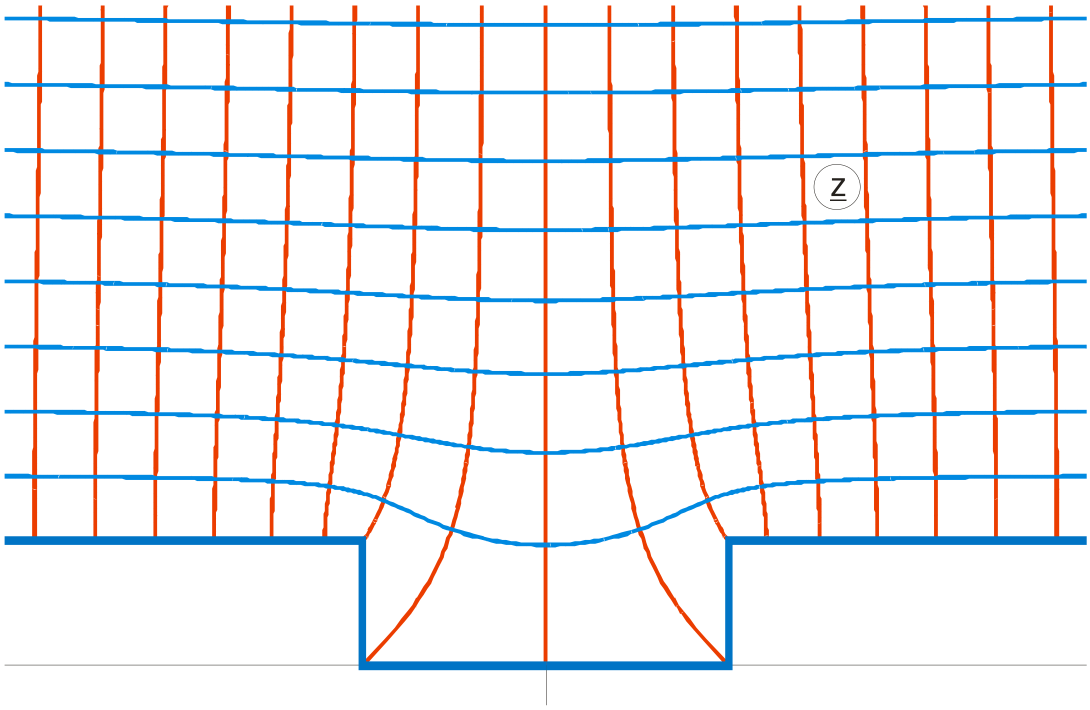
$h = \tan\varphi$

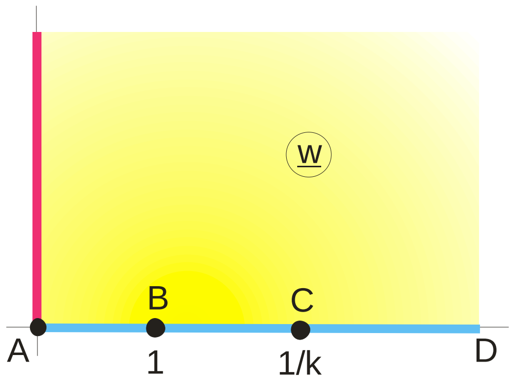
$r = 1/\sin(2\varphi)$

$\varphi = 30°$

$0 \le u \le 1{,}5$

$0 \le v \le 2$





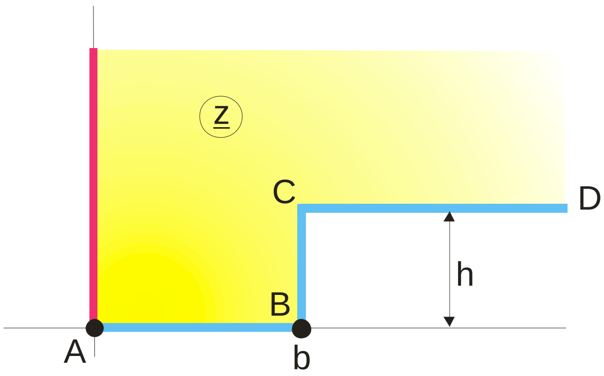


Abbildung A 10

$z = E_a(w,k)$

$-10 \leq u \leq 10$ $0 \leq v \leq 10$

$b = E$ $h = K' - E'$

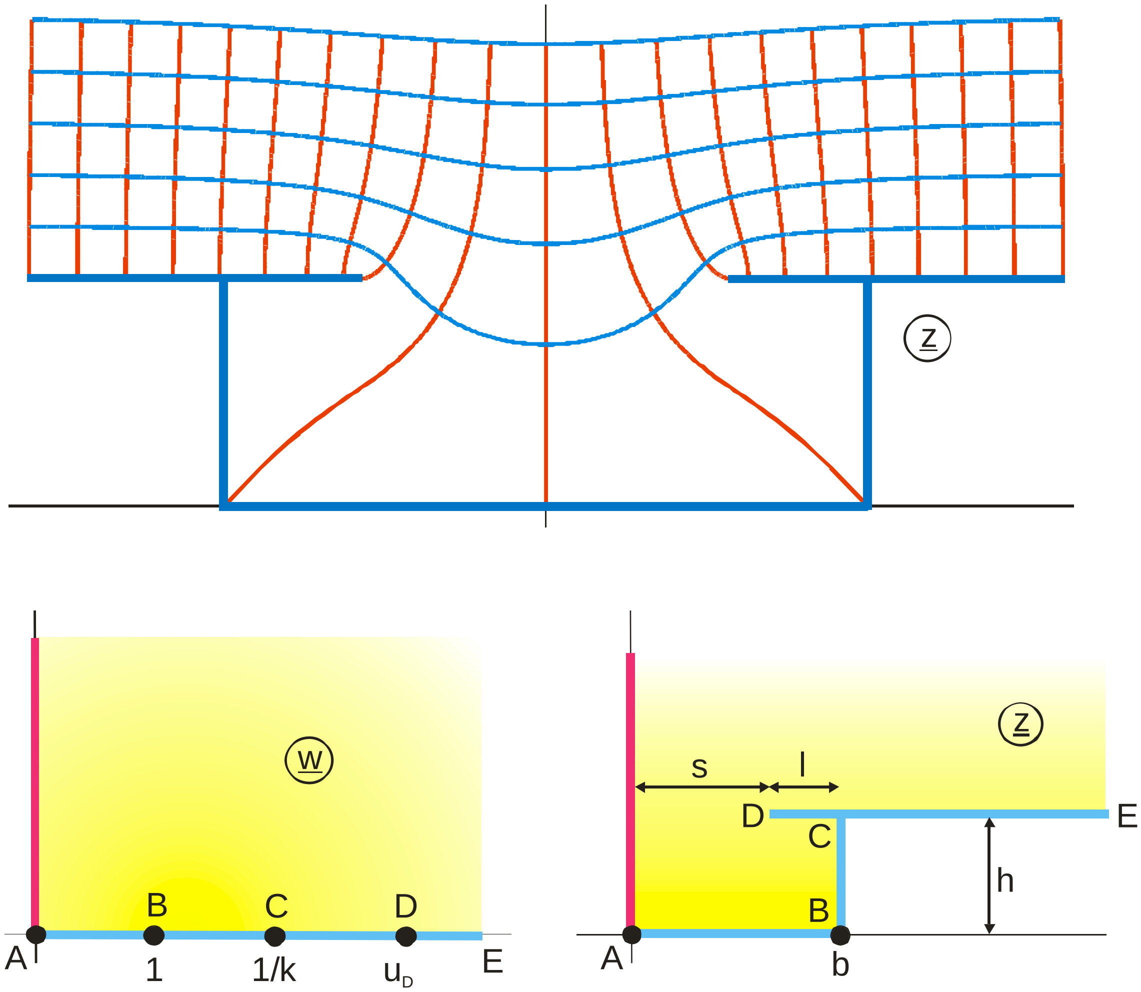


Abbildung A 10.1

$z = \tau\, E_a(w,k) + F_a(w,k)$

$-10 \le u \le 10$ $\qquad$ $0 \le v \le 5$

$b = \tau E + K$ $\qquad$ $h = \tau\,(K'-E') + K'$

$\tau = 0{,}5$ $\qquad$ $k = 0{,}85$

$s = \mathrm{Re}\{z(u_D)\}$ $\qquad$ $s = 0$ für $\tau = 0$

$$u_D = \frac{\sqrt{1+1/\tau}}{k}$$

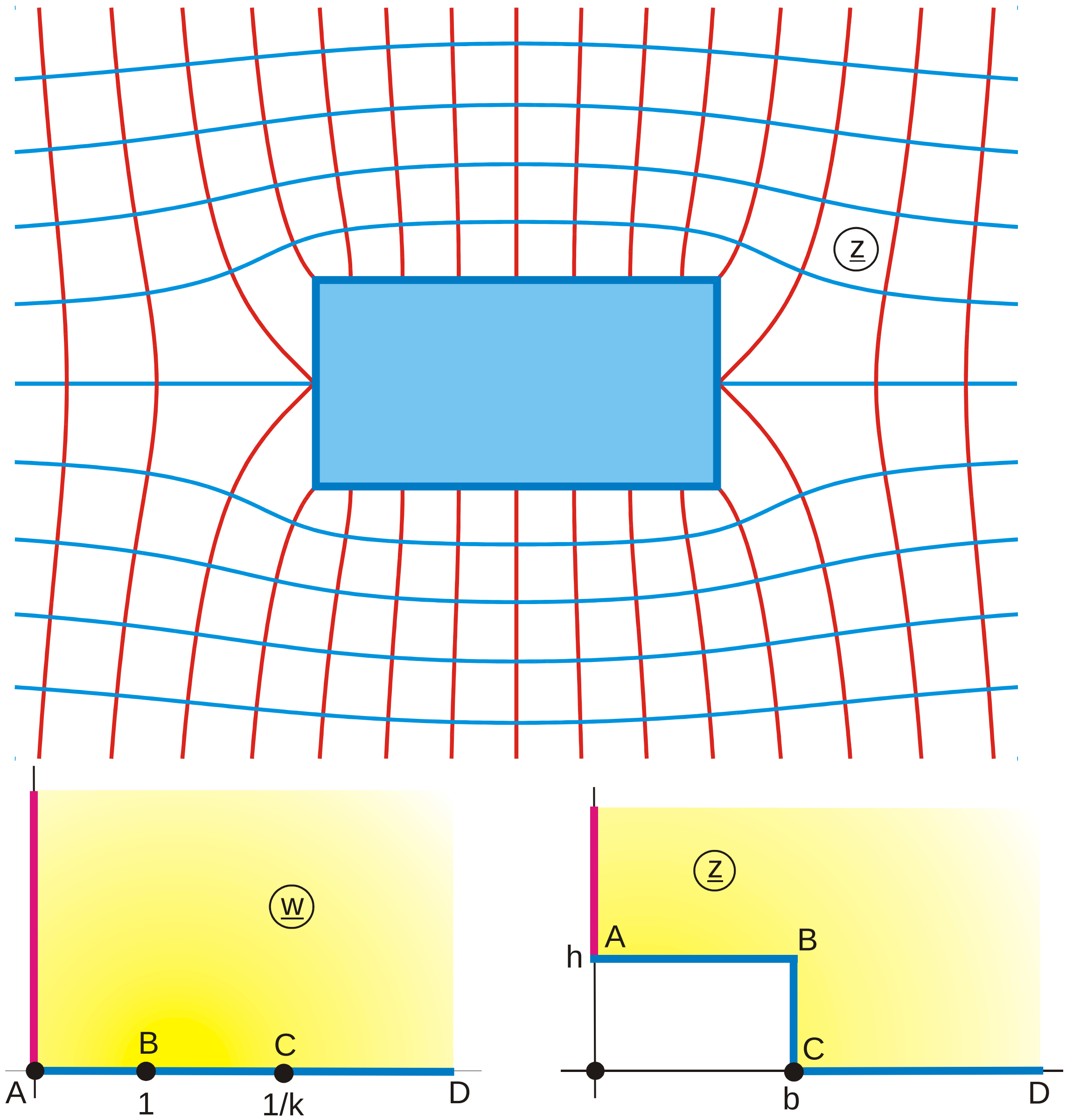
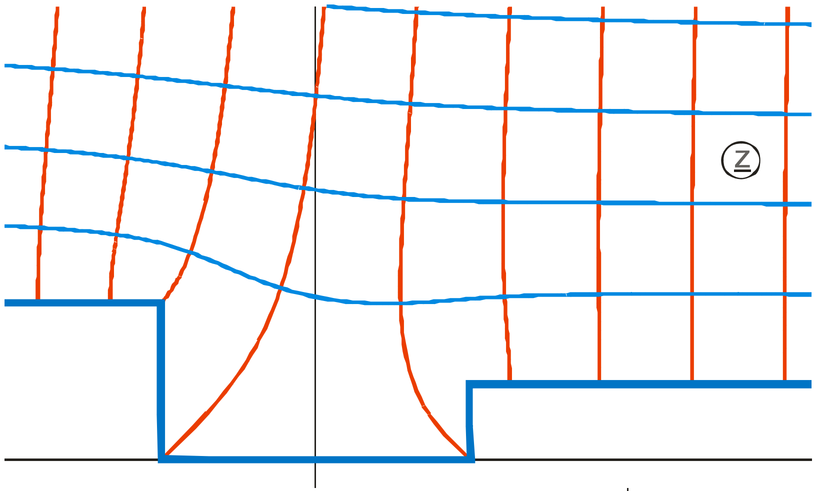


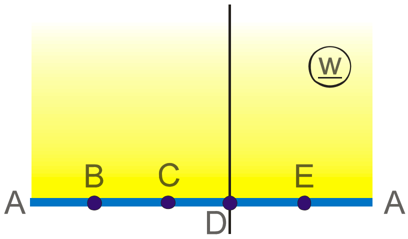
Abbildung A 10.2

$z = B_a(w,k) + jh$

$-10 \le u \le 10$ $\qquad$ $0 \le v \le 5$

$$h = \frac{E'}{k^2} - K' \qquad b = \frac{E - k'^2 K}{k^2}$$





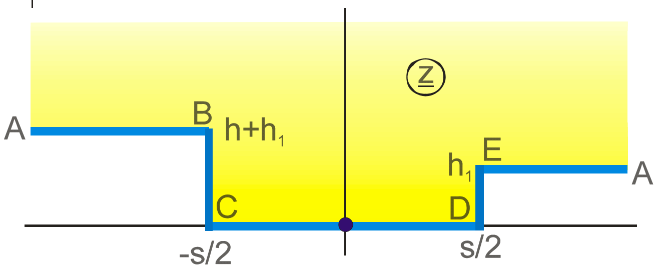
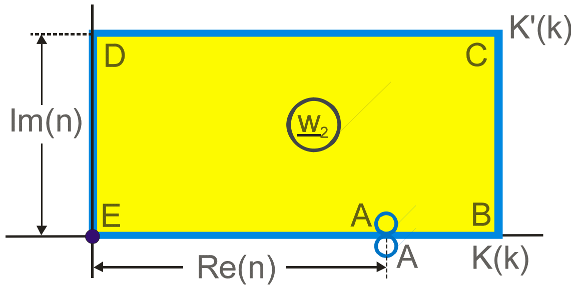


Abbildung A 10.3



gegeben: b < 1 und d > 1

$g = d^2 - 2d + k^2$ $\qquad k = \dfrac{(1-b)d}{d-b}$

$n = F_a\left(\dfrac{\sqrt{d}}{k}, k\right)$ $\qquad f = sn^2\{Re(n), k\}$

$$z = \frac{d^2\, sn\, cn\, dn(w_2,k)}{1 - d\, sn^2(w_2,k)} - d\, E_e(w_2,k) - (d-k^2)w_2 - g\, \Pi_e(w_2,k,n) + \frac{s}{2} + jh_1$$

$w_2 = F_a(w_1, k)$ $\qquad w_1 = \sqrt{f - 1/w}$

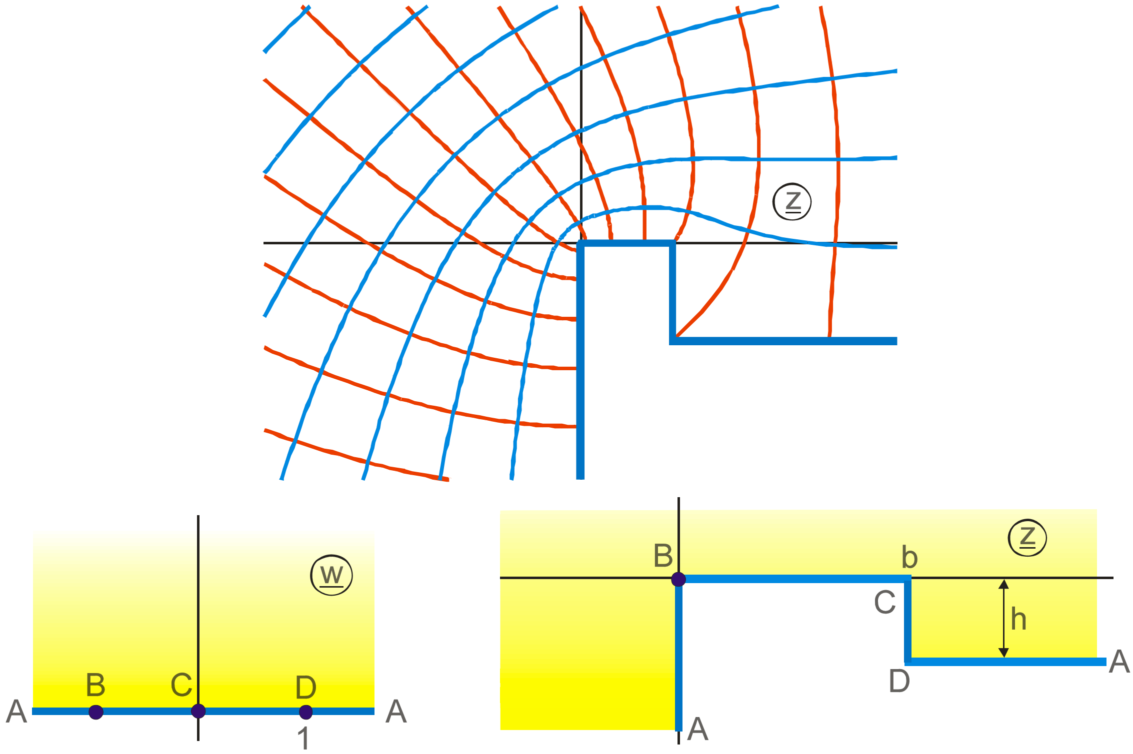
$$s = d\, E(k) + (d-k^2)K(k) + g\, \Pi(k, 1-d)$$

$$h = -g\, Im\left\{\Pi_e\left[K(k), k, n\right]\right\}$$

$$h_1 = d\left[K'(k) - E'(k)\right] + (d-k^2)\, K'(k) + g\, Im\left\{\Pi_e\left[K(k) + jK'(k), k, n\right]\right\}$$

$u_B = 1/(f-1)$ $\qquad u_C = 1/(f-1/k^2)$ $\qquad u_E = 1/f$

$-15 \leq u \leq 15$ $\qquad 0 \leq v \leq 15$



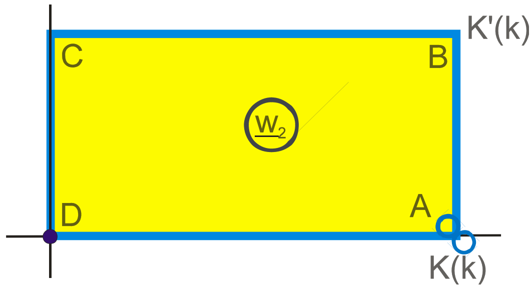


Abbildung A 10.4

$$w_1 = \sqrt{1 - 1/w}$$

$$w_2 = F_a(w_1, k)$$

$$w_3 = K(k) + jK'(k) - w_2$$

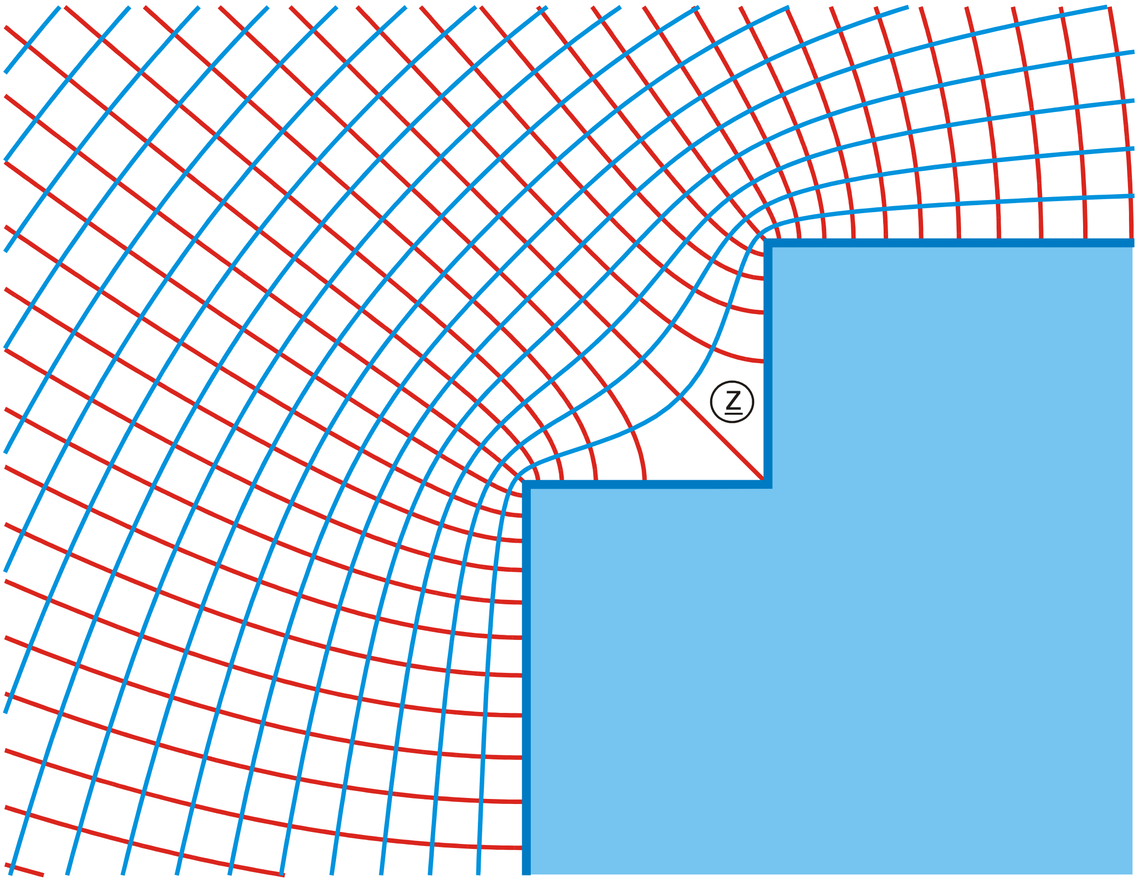
$$z = (2 - k^2)E_e(w_3, k) - 2k'^2\, w_3 - k^2 \,\mathrm{sn}\, w_3 \,\mathrm{cn}\, w_3 \,\mathrm{dn}\, w_3$$

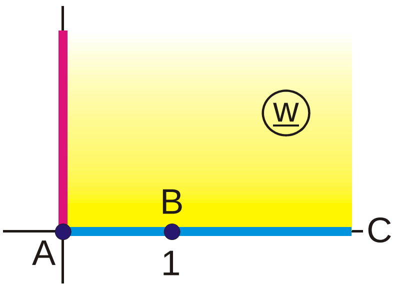
gegeben: k

$$u_B = \frac{k^2}{1 - k^2} = \left(\frac{k}{k'}\right)^2$$

$$b = (2 - k^2)\,E(k) - 2k'^2\, K(k)$$

$$h = (2 - k^2)\,E'(k) - k^2 K'(k)$$





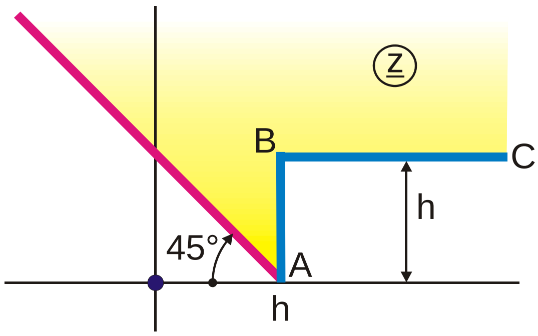


Abbildung A 10.5

$w_1 = \sqrt{1 - 1/w}$

$w_2 = F_a(w_1, k)$

$w_3 = K(k) + jK'(k) - w_2$

$z = w_3 - \mathrm{sn}\, w_3\, \mathrm{cn}\, w_3\, \mathrm{dn}\, w_3$

gegeben: k = 1/sqr(2) $\qquad$ h = K(k)

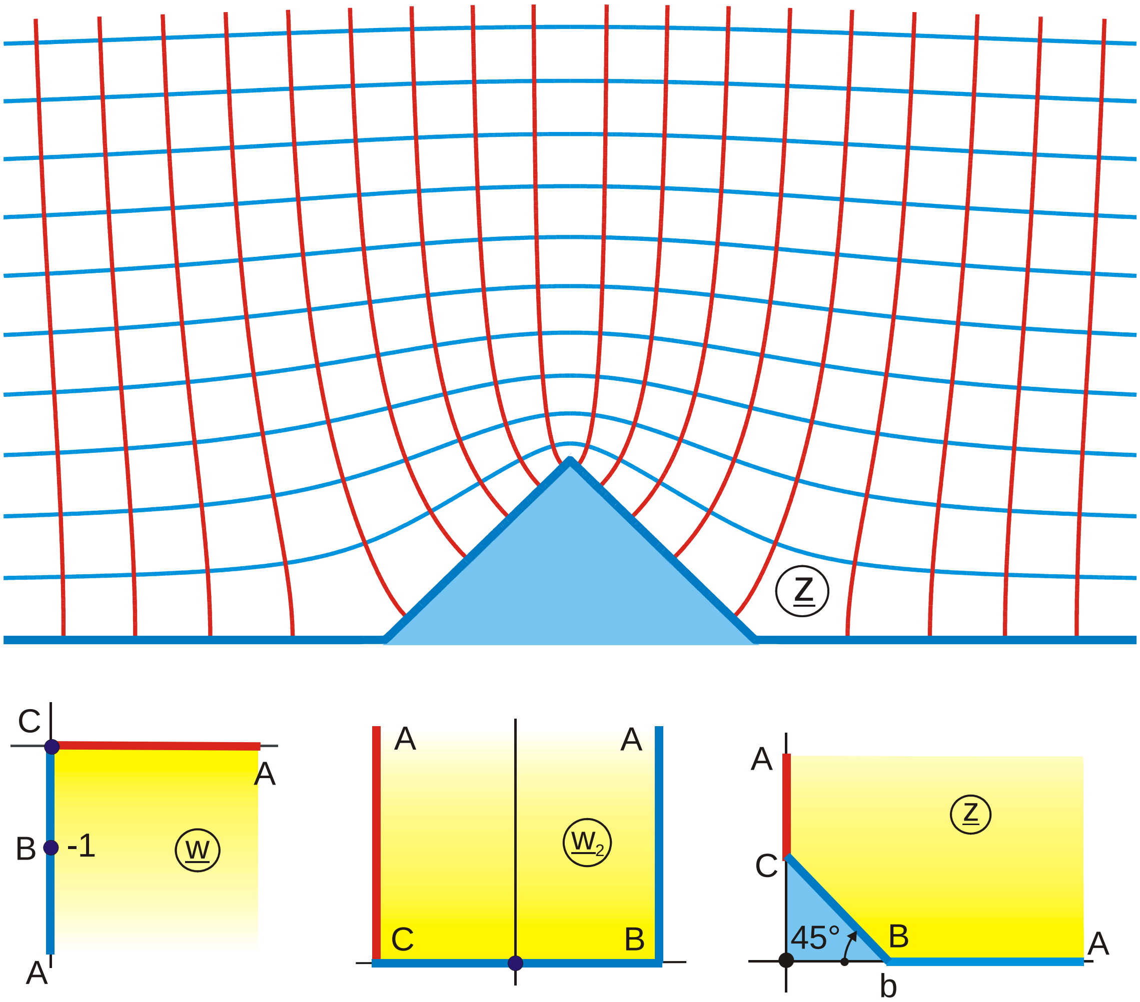


Abbildung A 10.6

$a = 2\,E(k) - K(k)$

$0 \le u \le 2$ $\qquad$ $-3 \le v \le 0$

$k = 1/\sqrt{2}$ $\qquad$ $b = 2\sqrt{2}$

$$z = 2\sqrt{2} + \exp(-j\pi/4)\left[w_3 - 1\right] \qquad w_3 = \frac{1}{a} B_a\left(\frac{\sin w_2}{k}, k\right)$$

$$w_2 = jw_1 - \pi/4 \qquad w_1 = \ln\left(w + \sqrt{w^2 + 1}\right)$$

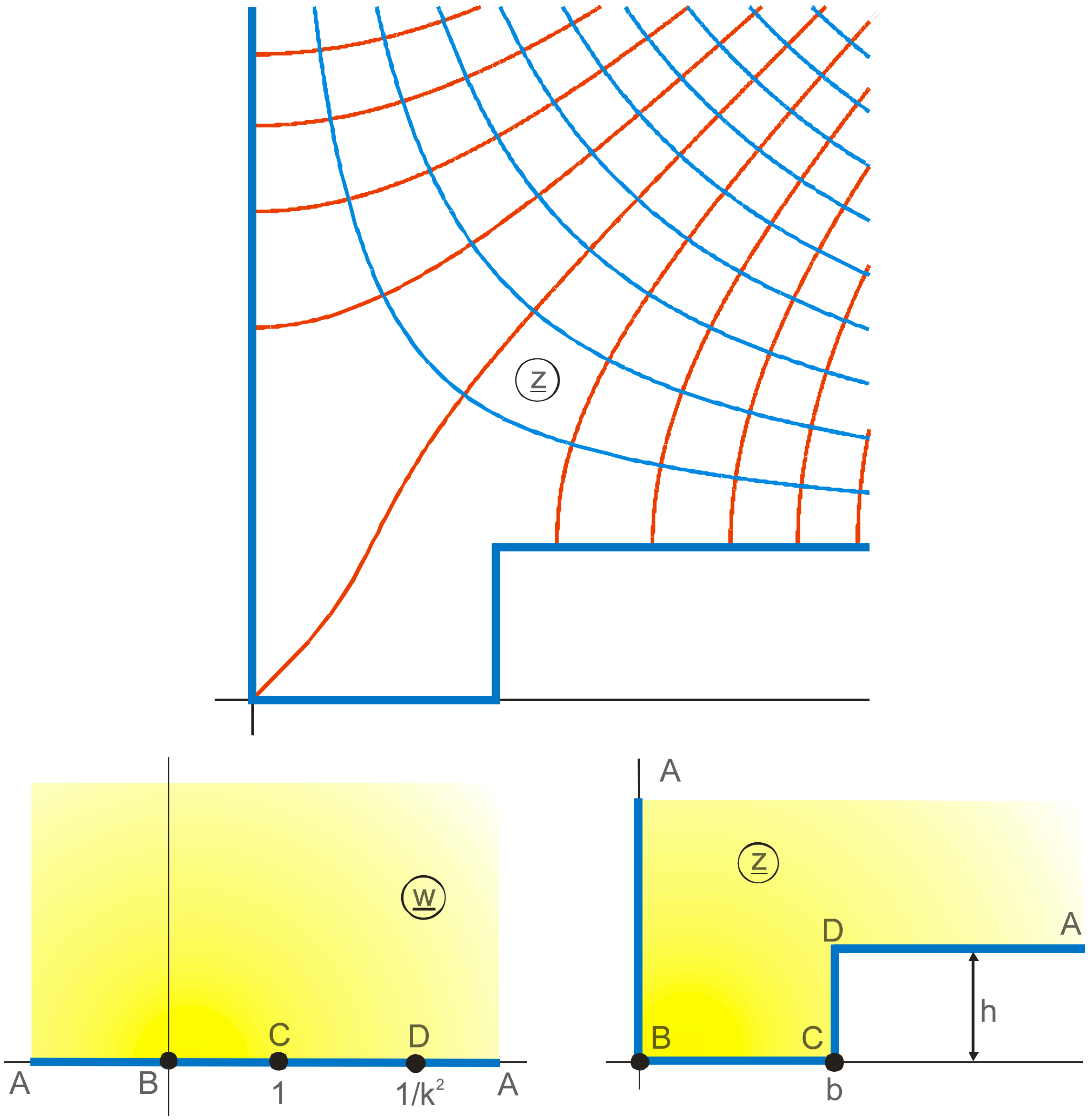


Abbildung A 10.7

$h = K'(k) - E'(k)$

$-100 \le u \le 100$ $0 \le v \le 100$

gegeben: k

$z = E_a\left(\sqrt{w}, k\right)$

$b = E(k)$

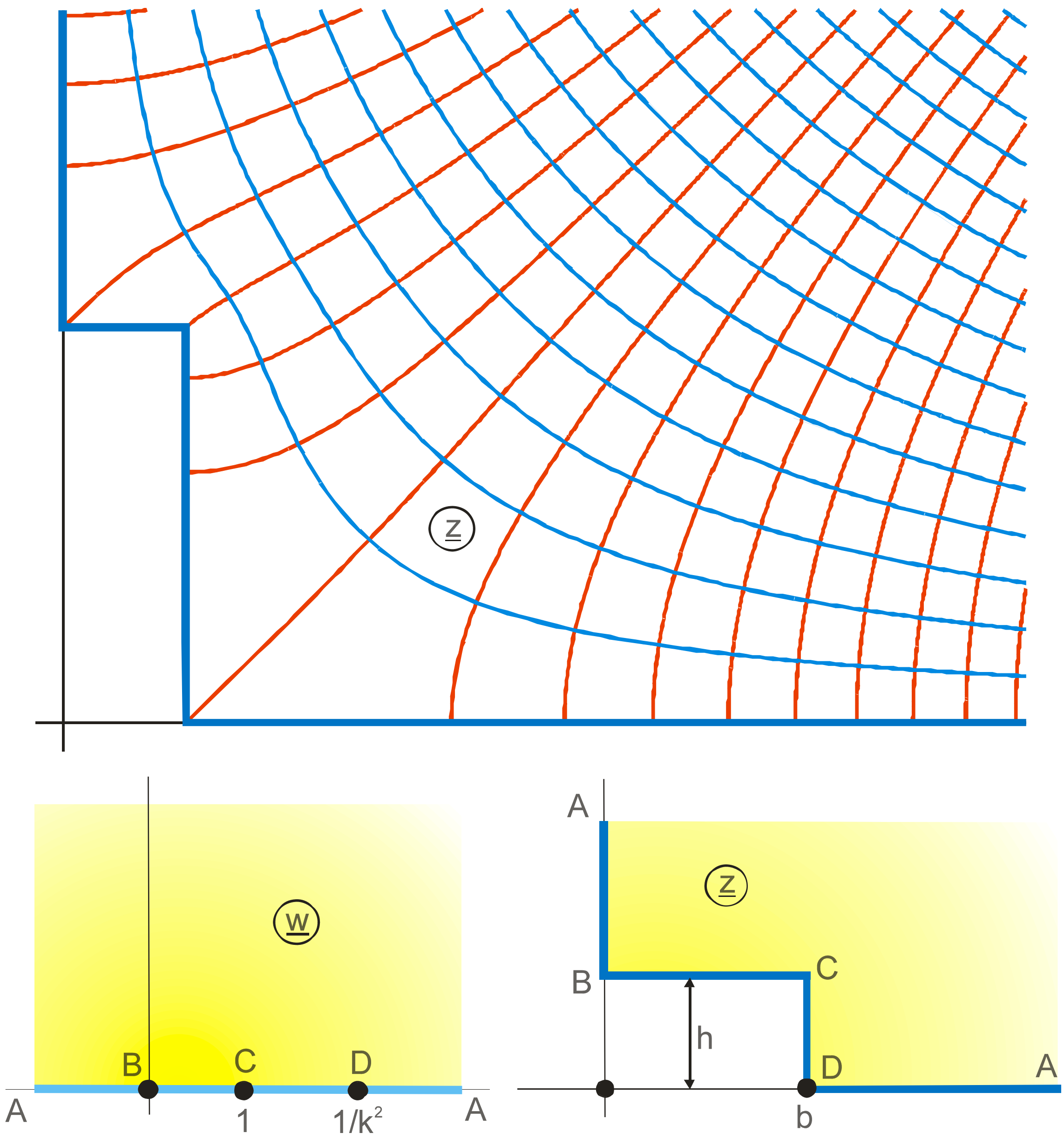


Abbildung A 10.8

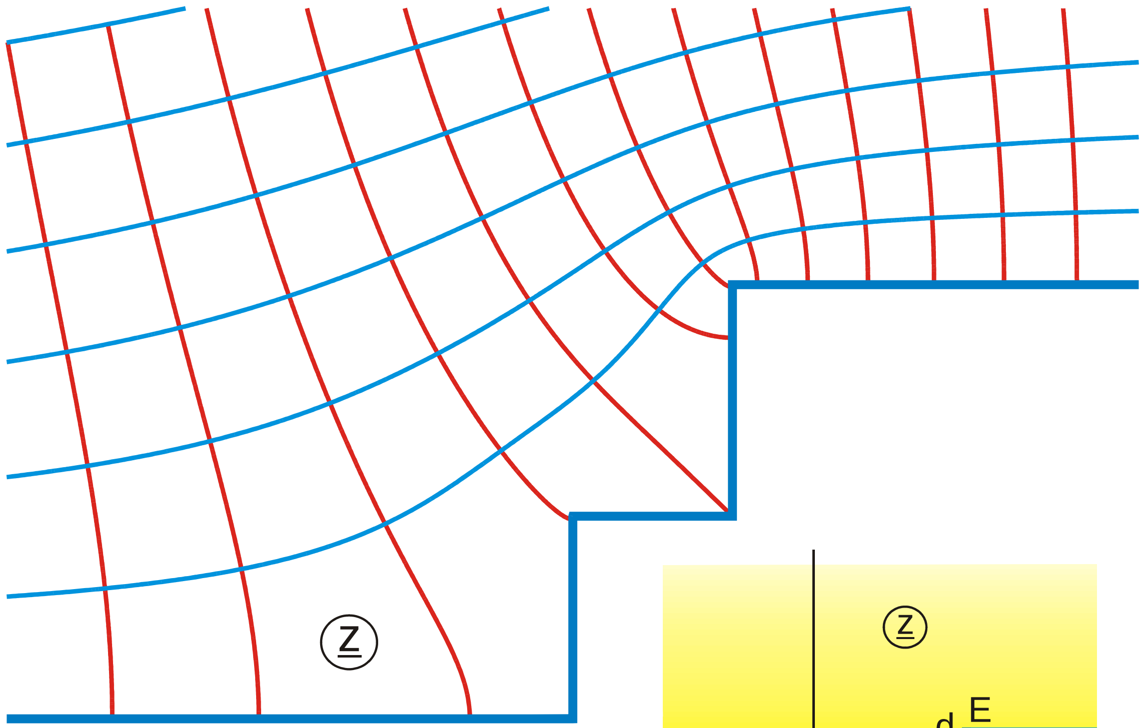
$$z = B_a\left(\sqrt{w}, k\right) + jh$$

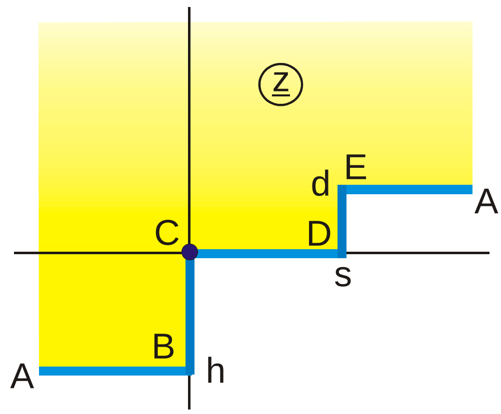
$h = E'(k)/k^2 - K'(k)$

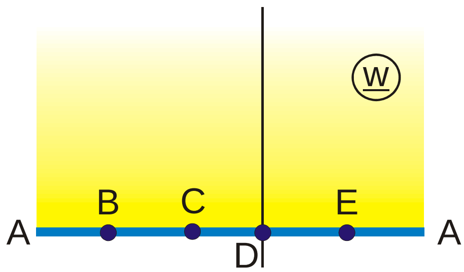
$$b = \frac{E(k) - k'^2 K(k)}{k^2}$$

gegeben: k

$-10 \le u \le 20$ $\quad 0 \le v \le 15$







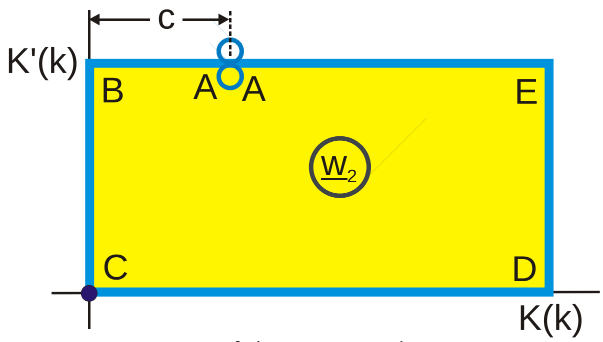


Abbildung A 10.9

$c = F_a(a/k,k)$

$b = sn^2\{K(k) - c, k\}$

gegeben: a, k; a < k

$w_1 = \sqrt{b - 1/w}$

$$w_2 = K(k) - jK'(k) - F_a\left(w_1, k\right)$$

$$z = E_e(w_2,k) - \left\{1 + \left(\frac{k}{a}\right)^2 - 2k^2\right\} w_2 - \left\{2k^2 - a^2 - \left(\frac{k}{a}\right)^2\right\} \Pi_e(w_2,k,c) - \frac{a^2 \operatorname{sn} \operatorname{cn} \operatorname{dn}(w_2,k)}{1 - a^2 \operatorname{sn}^2(w_2,k)}$$

$u_B = 1/(b-1)$ $u_C = 1/(b-1/k2)$ $u_E = 1/b$

$k = 0{,}8$ $a = 0{,}7$ $b = 0{,}47$

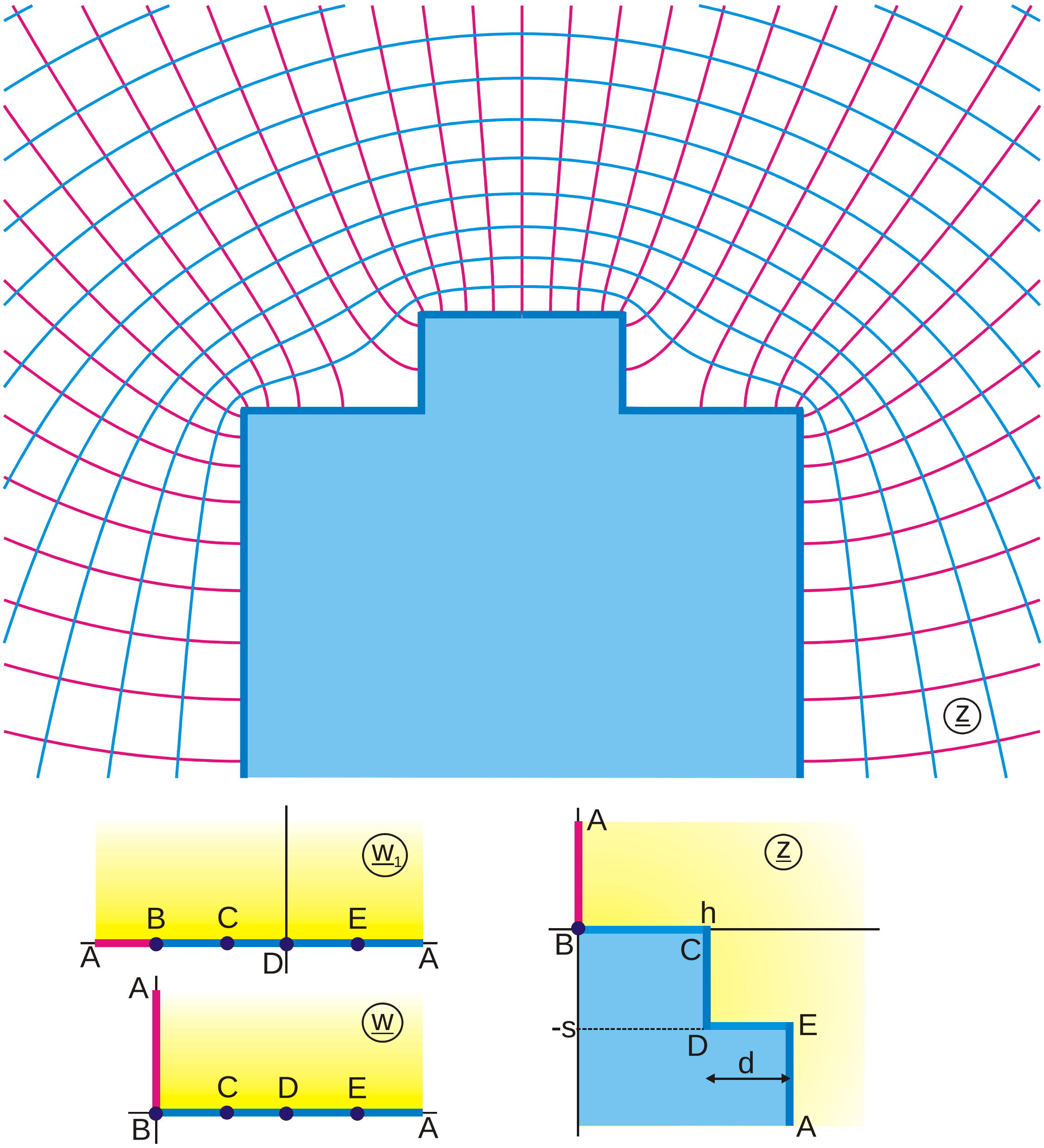


Abbildung A 10.10

$c = F_a(a/k,k)$ $\quad$ $b = \mathrm{sn}^2\{K(k) - c, k\}$ $\quad$ gegeben: a, k; a < k

$w_0 = w^2 + 1/(b-1)$ $\quad$ $w_1 = \sqrt{b - 1/w_0}$ $\quad$ $w_2 = K(k) - jK'(k) - F_a(w_1, k)$

$$z = E_e(w_2,k) - \left\{1 + \left(\frac{k}{a}\right)^2 - 2k^2\right\} w_2 - \left\{2k^2 - a^2 - \left(\frac{k}{a}\right)^2\right\} \Pi_e(w_2,k,c) - \frac{a^2 \mathrm{sn}\,\mathrm{cn}\,\mathrm{dn}(w_2,k)}{1 - a^2 \mathrm{sn}^2(w_2,k)}$$

$u_B(w_1) = 1/(b-1)$ $\quad$ $u_C(w_1) = 1/(b-1/k2)$ $\quad$ $u_E(w_1) = 1/b$

$0 \le u \le 4$ $\quad$ $0 \le v \le 3$ $\quad$ $h = -\mathrm{Im}\{w_1(u_B)\}$

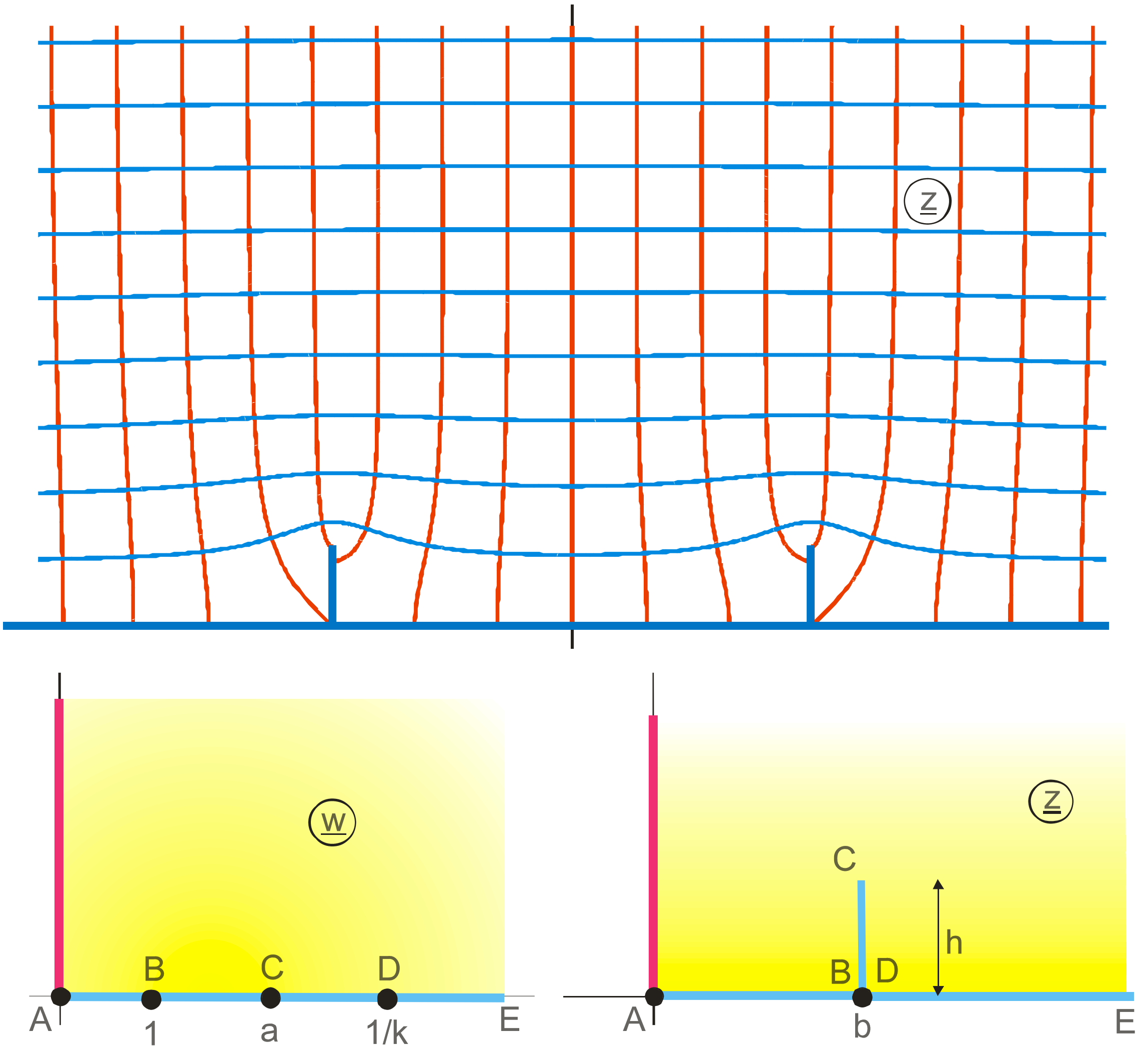


Abbildung A 11

$$z = Z_e(w_1) + \frac{\pi}{2KK'} w_1$$

$w_1 = F_a(w)$

$-4 \le u \le 4$ $\quad$ $0 \le v \le 4$

gegeben: k $\quad$ $k = 0{,}5$

$$a = \frac{1}{k}\sqrt{\frac{E'}{K'}} \qquad b = \frac{\pi}{2K'}$$

$$h = -Z_e(c,k') + \frac{\text{dn sn}}{\text{cn}}(c,k') - k^2 \frac{\text{sn}}{\text{cn dn}}(c,k') \qquad \text{mit } c = \text{Im}\{F_a(a,k)\}$$

$$h = E_a(t,k') - \frac{E'}{K'} F_a(t,k') \qquad \text{mit } t = \frac{1}{k'}\sqrt{1 - \frac{E'}{K'}}$$

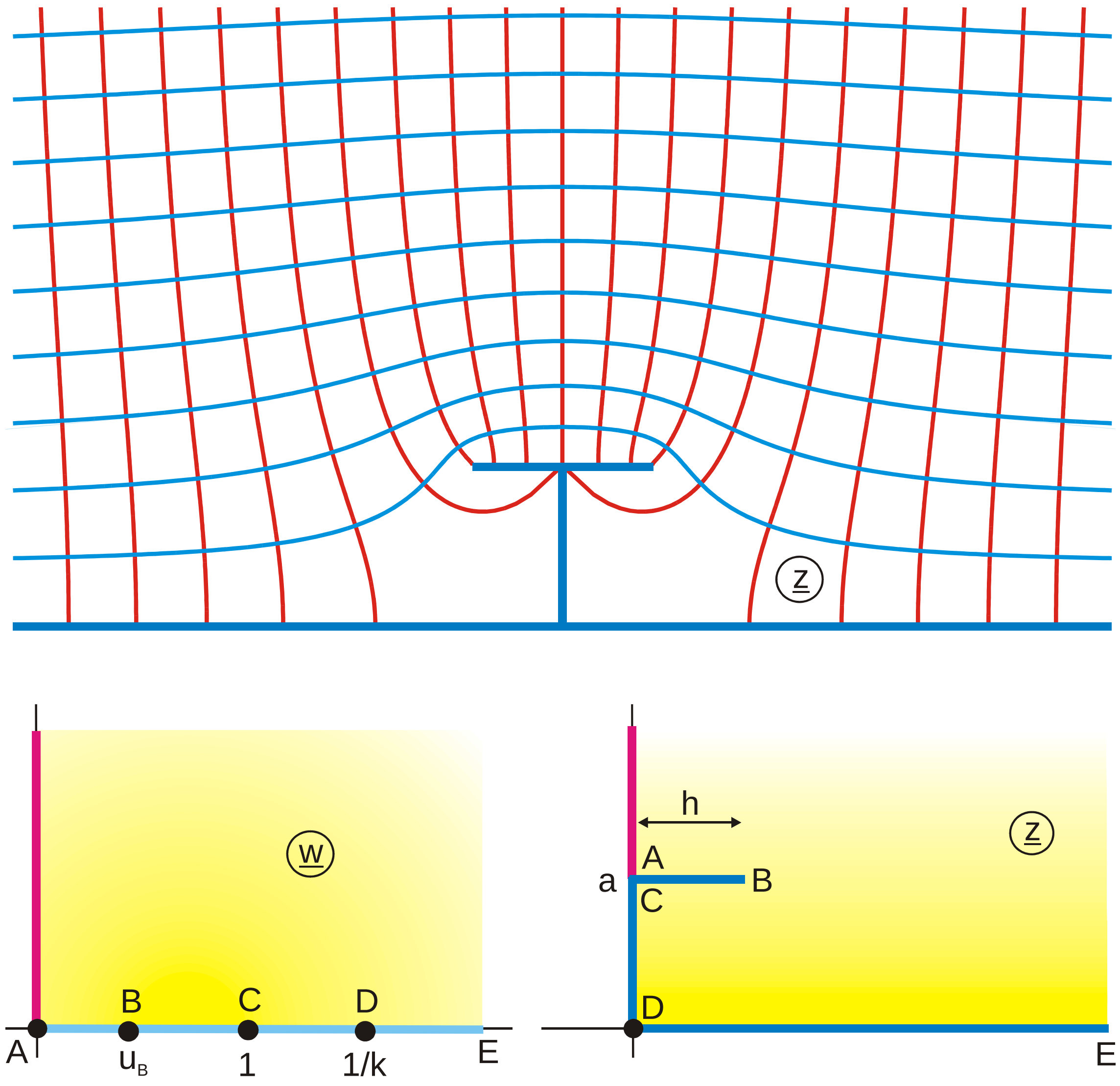


Abbildung A 11.1

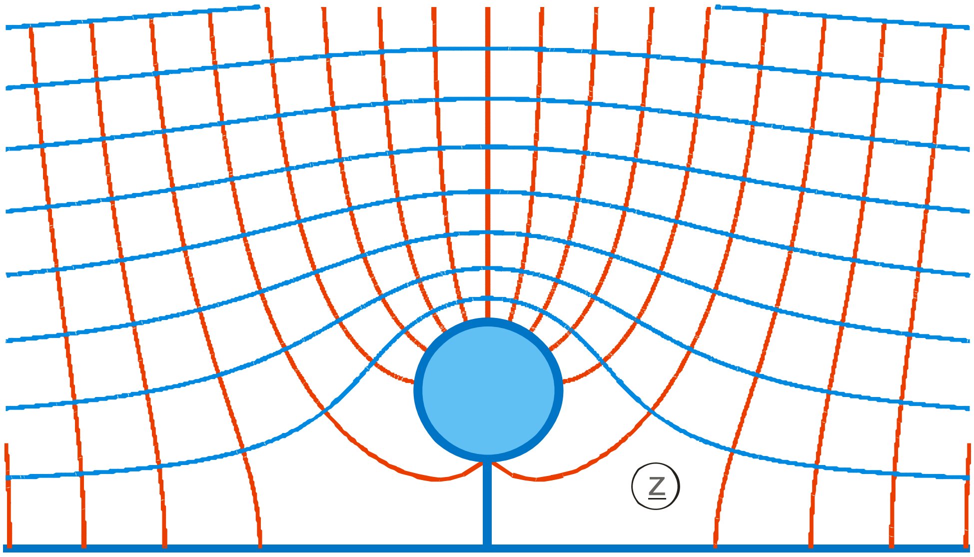
$$z = Z_a(w,k) + ja$$

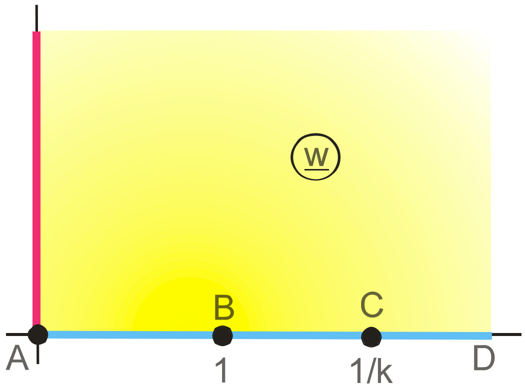
$$h = Z_e(\lambda,k) \qquad \lambda = F_a\left(\frac{1}{k}\sqrt{1-\frac{E}{K}},k\right)$$

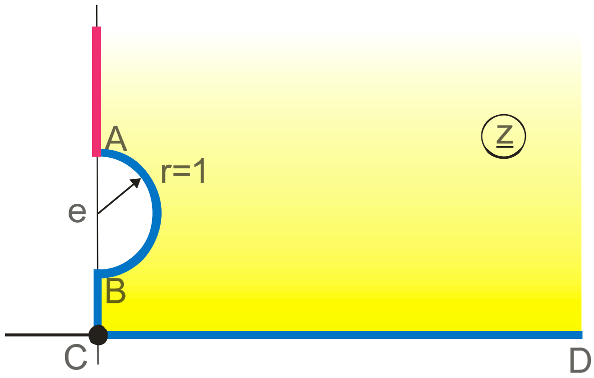
$$0 \le u \le 5 \qquad 0 \le v \le 5$$

$$a = \frac{\pi}{2K}$$

$$h = Z_a(u_B,k) \qquad u_B = \mathrm{sn}\,(\lambda,k) = \frac{1}{k}\sqrt{1-\frac{E}{K}}$$







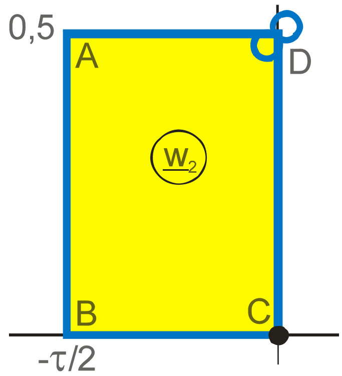


Abbildung A 11.2

$$z = -j a \tanh(w_2 \pi)$$

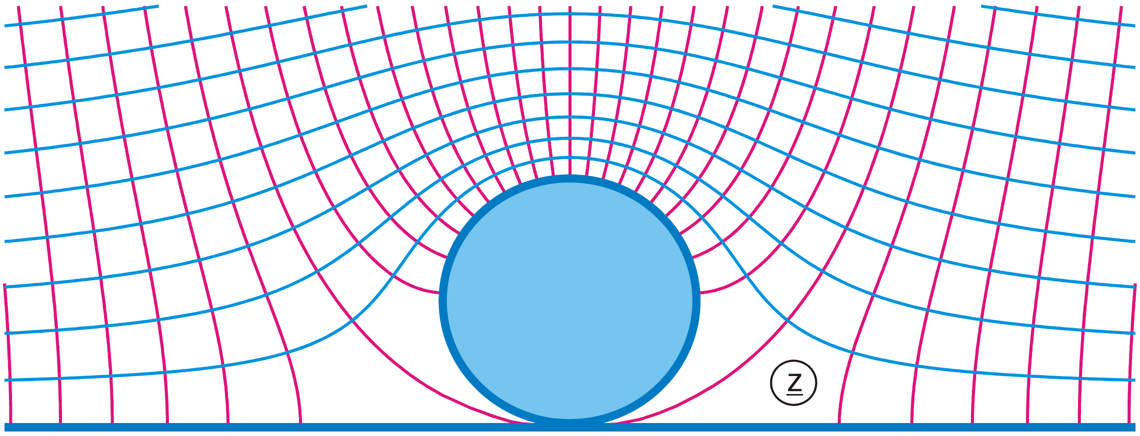
$$w_2 = \frac{j[K(k) - w_1] - K'(k)}{2K(k)}$$

$w_1 = F_a(w,k)$

gegeben: e

$$\tau = \frac{1}{\pi} \operatorname{ar\,sinh} a \qquad k = \left(\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right)^2$$

$$a = \sqrt{e^2 - 1}$$



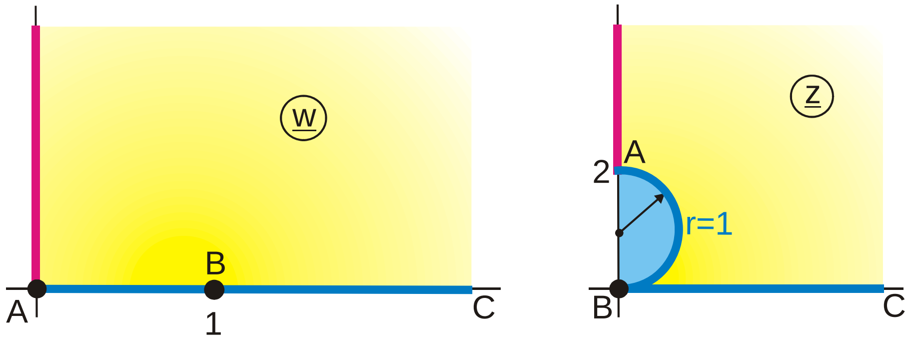


Abbildung A 11.3

$$z = \frac{2\pi}{w_1}$$

$$w_1 = \ln \frac{w+1}{w-1}$$

$0 \le u \le 2$ $\qquad$ $0 \le v \le 2$

Abbildungen Gruppe B

Eine leitende Elektrode endlicher Ausdehnung

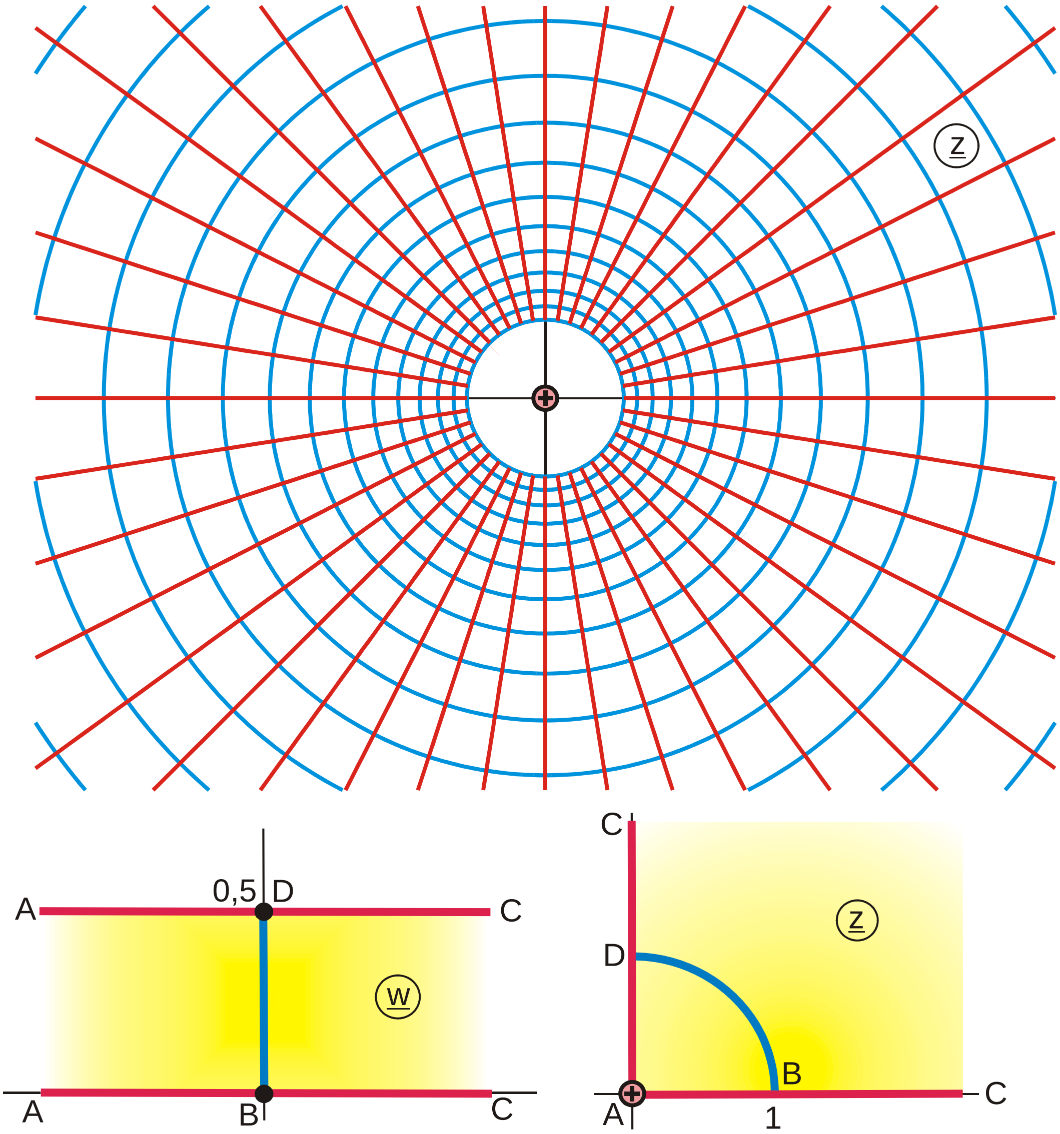


Abbildung B 1 (konzentrische Kreise)

$z = \exp(\pi w)$

$0 \leq u \leq 0{,}5$ $\quad$ $0 \leq v \leq 0{,}5$

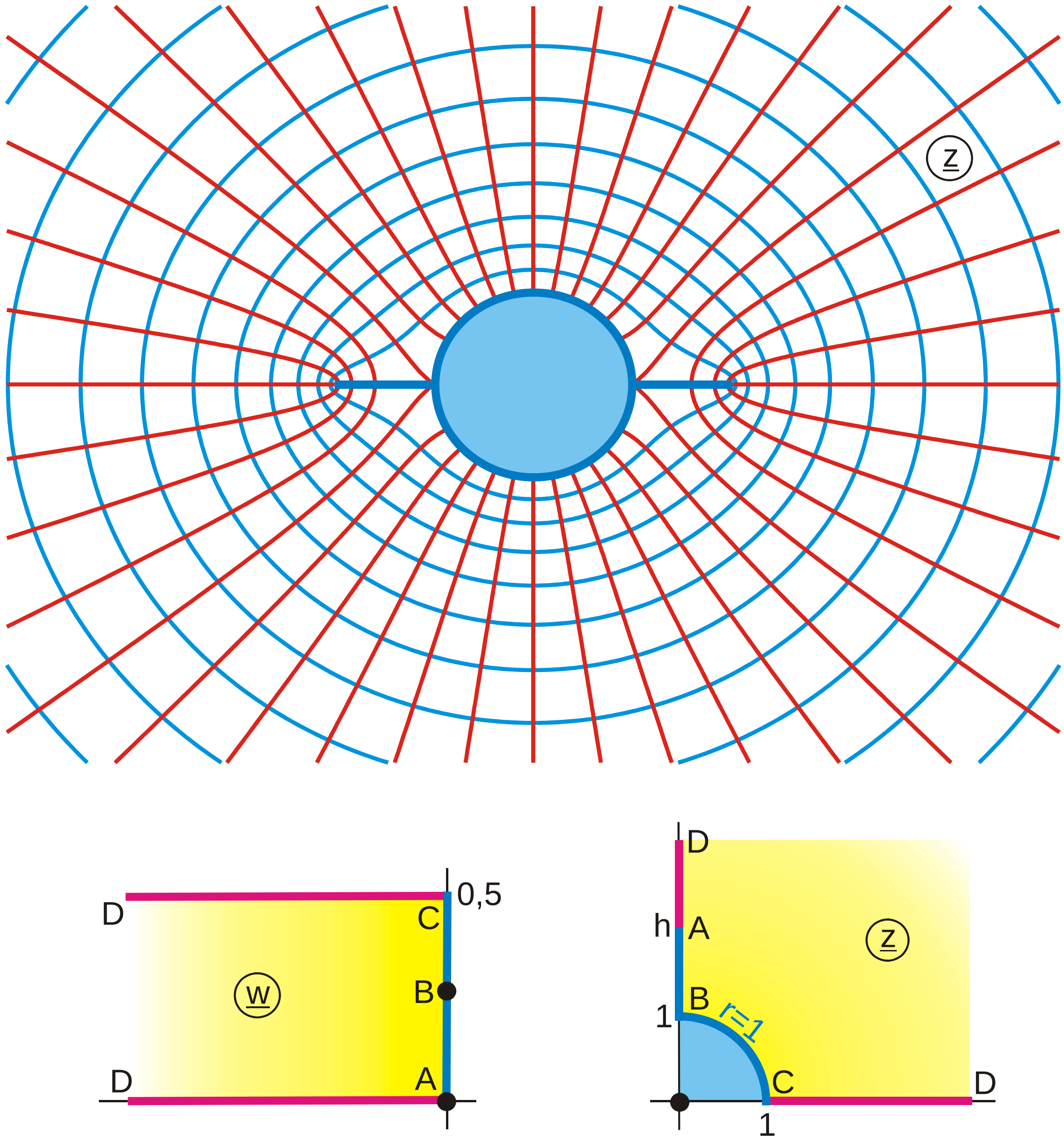


Abbildung B 1.1

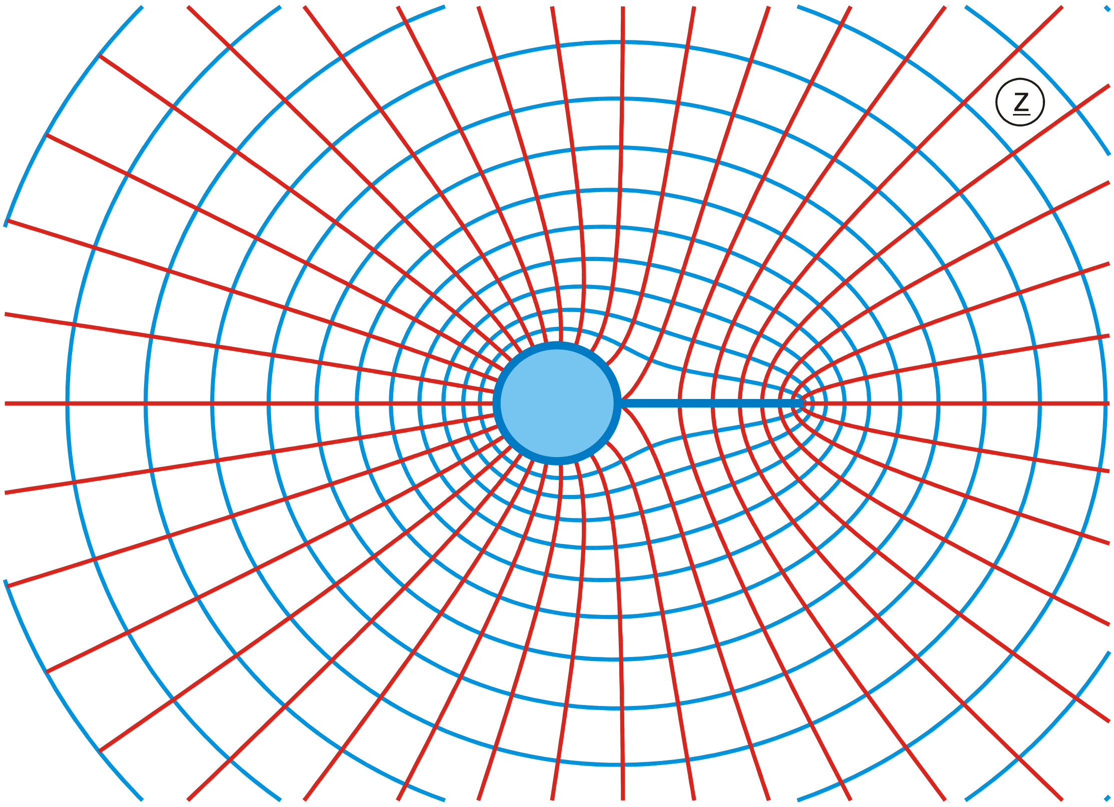
$$z = jw_1 + \sqrt{1 - w_1^{\,2}}$$

$w_1 = a\,(w_0 + 1/w_0)$ $\qquad$ $w_0 = \exp(w\pi)$

$a > 0{,}5$: $h = 1$ für $a = 0{,}5$

$-0{,}5 \le u \le 0$ $\qquad$ $0 \le v \le 0{,}5$

$$v_B = \frac{1}{\pi}\arccos\left(\frac{1}{2a}\right) \qquad h = 2a + \sqrt{4a^2 - 1}$$



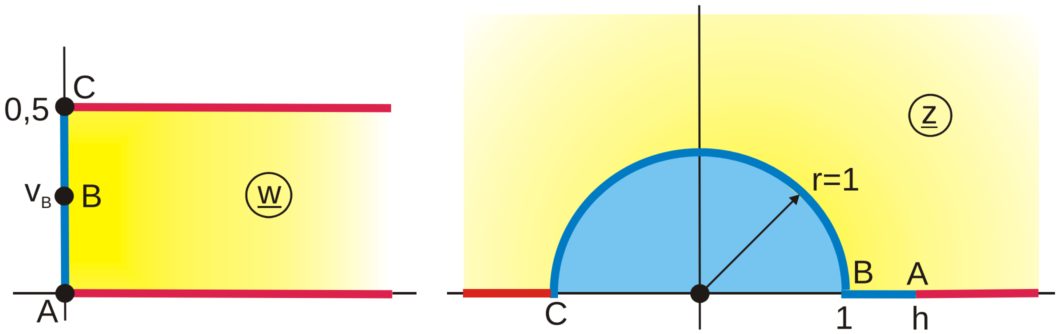


Abbildung B 1.2

$z = -w_3^2$

$w_3 = 1/w_2$

$w_2 = jw_1 + \sqrt{1 - w_1^2}$

$w_1 = a\,(w_0 + 1/w_0)$

$w_0 = \exp(w\pi)$

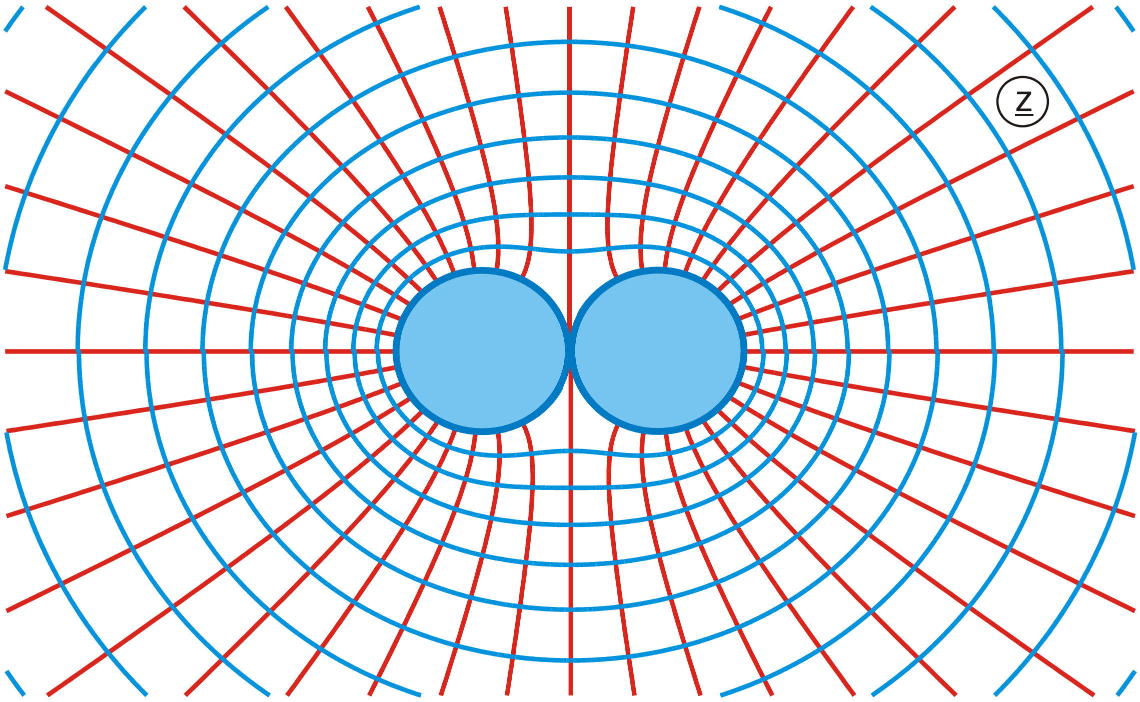
$a > 0{,}5$: $h = 1$ für $a = 0{,}5$

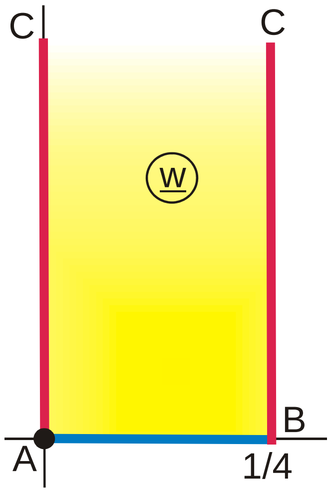
$0 \le u \le 0{,}6$

$0 \le v \le 0{,}5$

$$v_B = \frac{1}{\pi}\arccos\left(\frac{1}{2a}\right)$$

$$h = \left(2a + \sqrt{4a^2 - 1}\right)^2$$





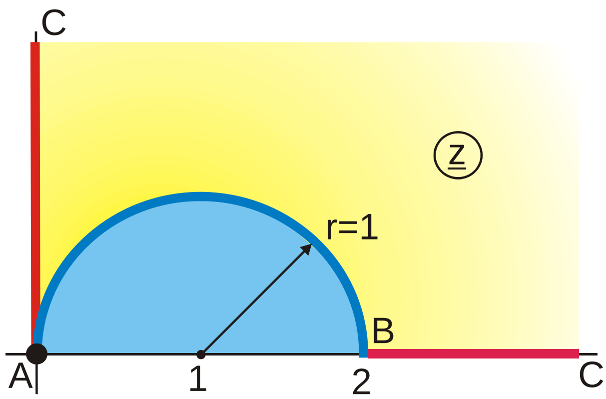


Abbildung B 1.3

$$z = \frac{1}{\frac{1}{2} + j\frac{1}{\pi}\ln\,\tanh(w\pi)}$$

$0 \le u \le 0{,}25$

$0 \le v \le 0{,}25$

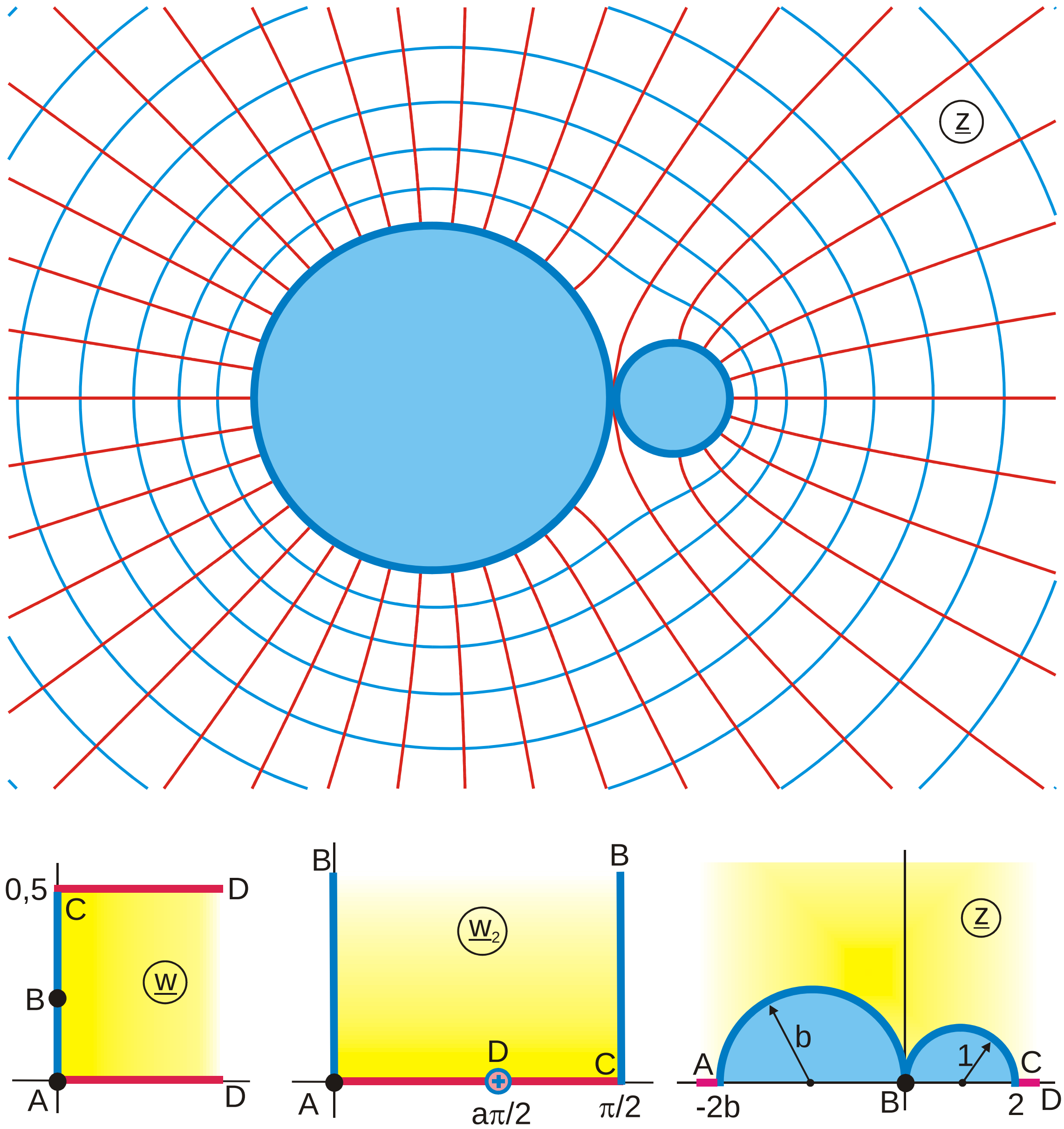


Abbildung B 1.4

$$z = \frac{1}{w_3}$$

$$w_3 = \left(w_2 - a\frac{\pi}{2} \right) \Big/ r_2$$

$$w_2 = \arctan\left\{ \frac{w_1 - 1}{w_1 + 1} \tan\frac{a\pi}{2} \right\}$$

$$w_1 = \exp(2\pi w)$$

$$r_2 = \frac{2}{(1-a)\pi}$$

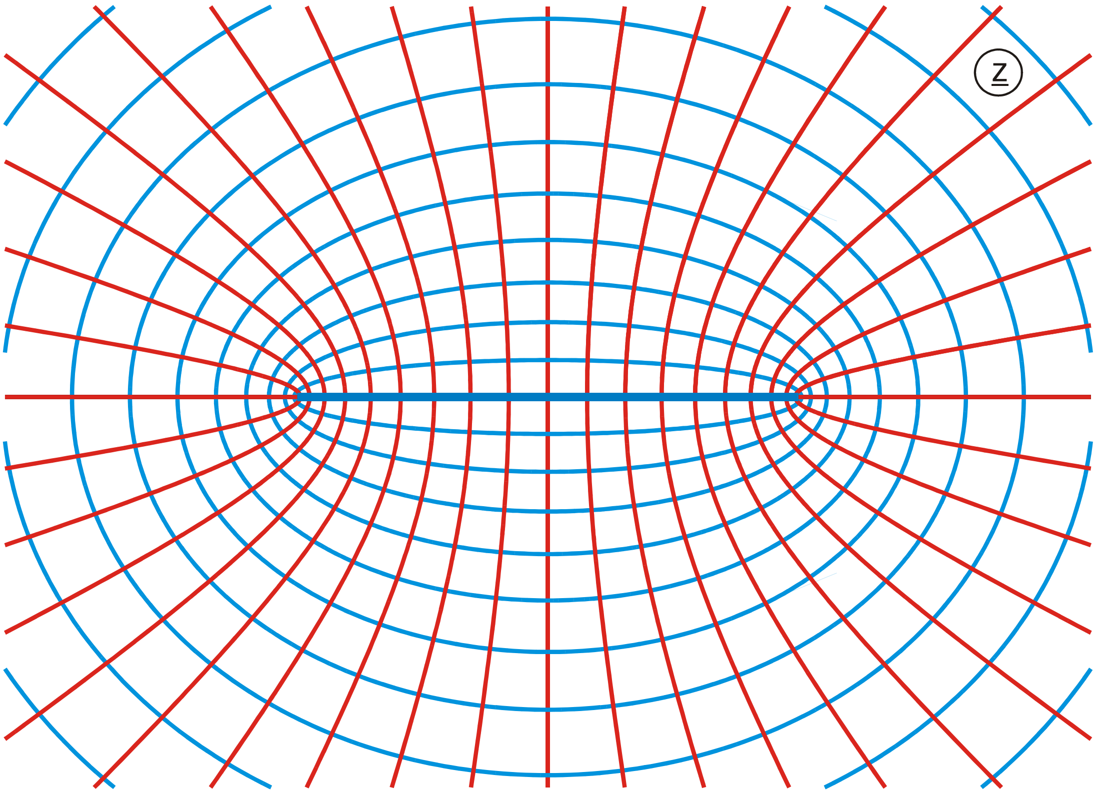
$$a = \frac{1}{1+b}$$

gegeben: b

$$v_B = \frac{1-a}{2}$$

$0 \le u \le 0{,}25$

$0 \le v \le 0{,}5$



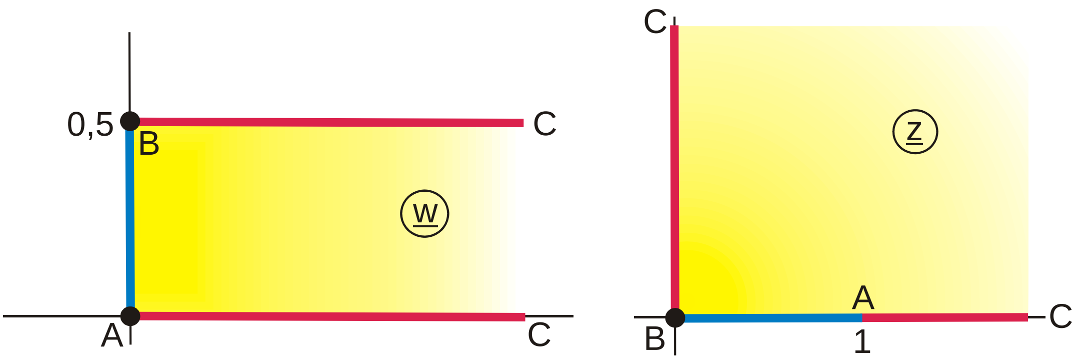


Abbildung B 2 (konfokale Ellipsen und Hyperbeln, Brennpunkte: +1 und -1)

$z = \cosh(w\pi)$

oder $z = \sin(w\pi)$

$0 \leq u \leq 0{,}6$ $0 \leq v \leq 0{,}5$

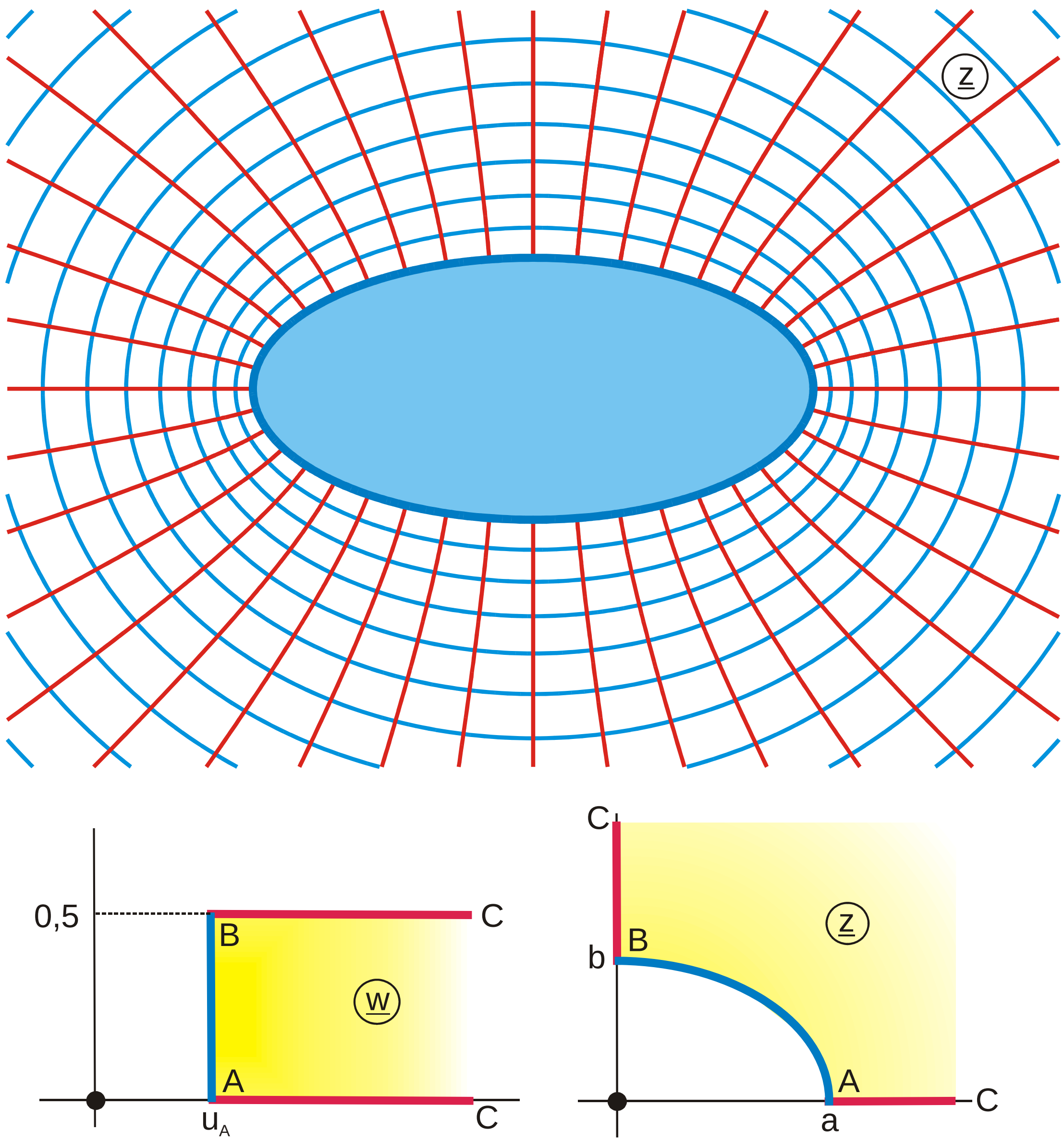


Abbildung B 2.1 (Ellipsen)

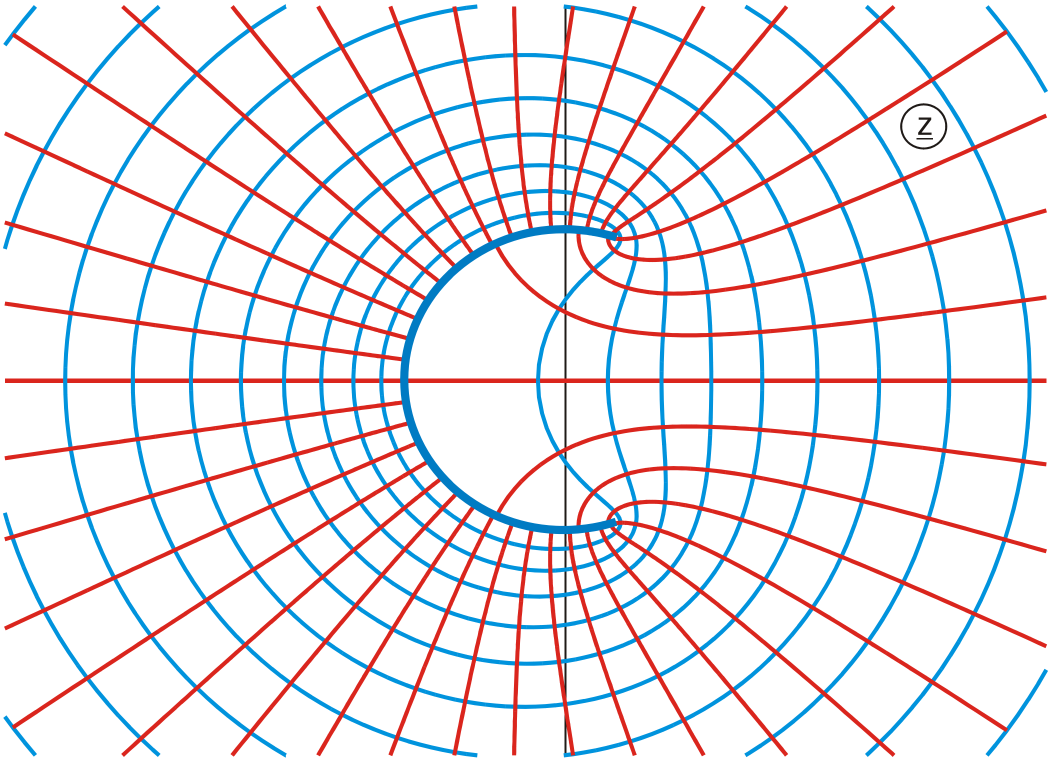
$z = \cosh(w\pi)$

$a = \cosh(u_A \pi)$ $b = \sinh(u_A \pi)$

$u_A = \frac{1}{\pi} \operatorname{ar\,tanh}\left(\frac{b}{a}\right)$

$0 \leq u \leq 0{,}6$ $0 \leq v \leq 0{,}5$

$b/a = 0{,}5$



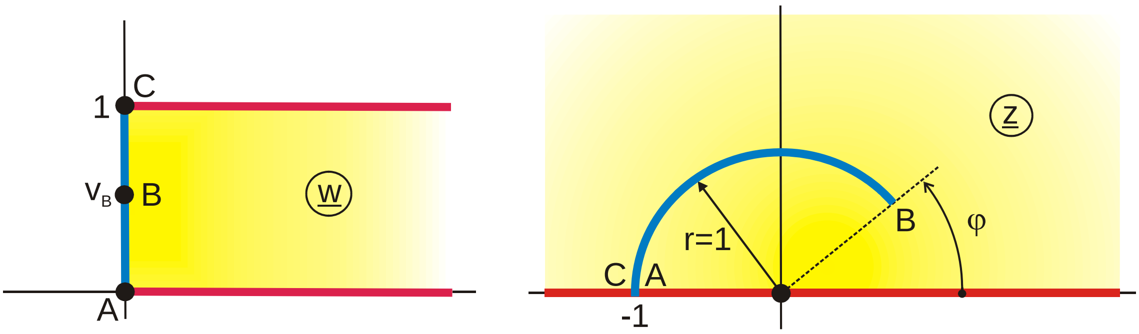


Abbildung B 2.2

$z = \frac{w_4 + j}{w_4 - j}$

$w_3 = -2b\frac{w_2}{w_2^2 + 1}$

$w_2 = ja\frac{1 + w_1}{1 - w_1}$

$w_1 = \exp(w\pi)$

$b = \frac{1}{\tan(\varphi/2)}$

$a = \tan(\varphi/4)$

$0 \le u \le 0{,}5$

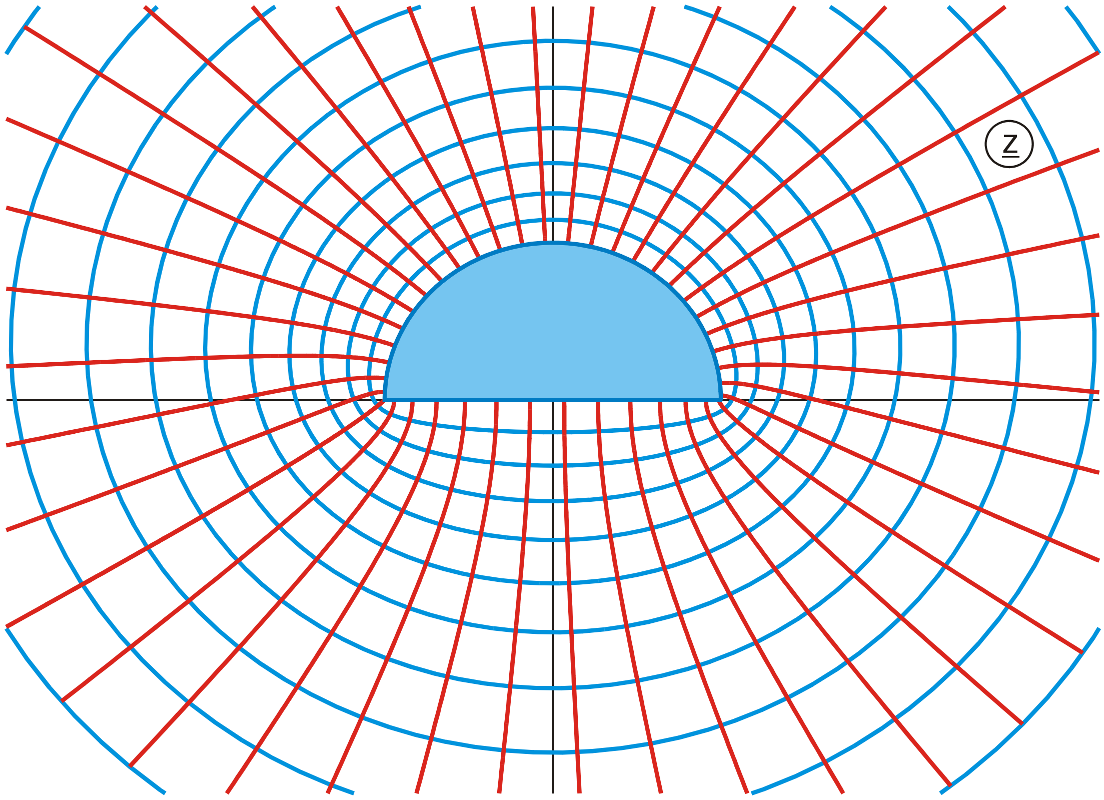
$0 \le v \le 1$

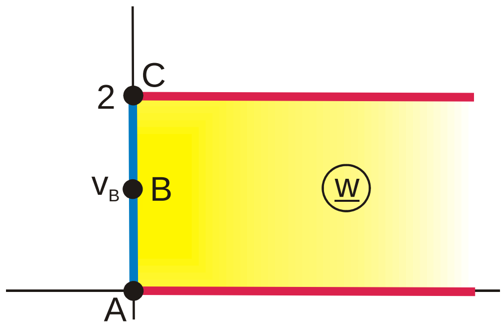
gegeben : τ

$h = K'(k)\frac{1+k}{2k}$

$v_B = \frac{\varphi}{2\pi}$

$\varphi = 72°$





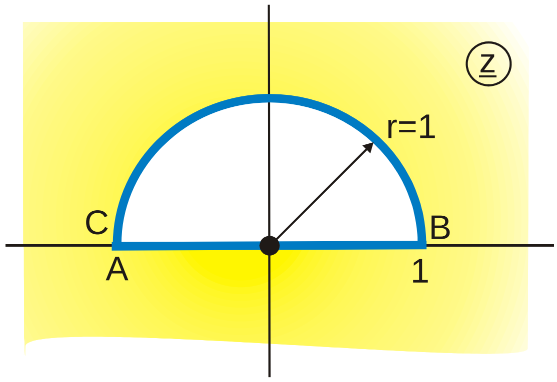


Abbildung B 3

$$z = \frac{1 - w_3}{1 + w_3} \qquad w_3 = w_2^{3/2}$$

$$w_2 = -\left(1 + j\sqrt{3}\,\frac{1 + w_1}{1 - w_1}\right)\Big/2 \qquad w_1 = \exp(w\pi)$$

$0 \le u \le 0{,}5$ $\qquad$ $0 \le v \le 2$

Das hier dargestellte Feldbild ist nicht zur Ebene x = 0 symmetrisch, da die erste Feldlinie im Punkt A beginnt.

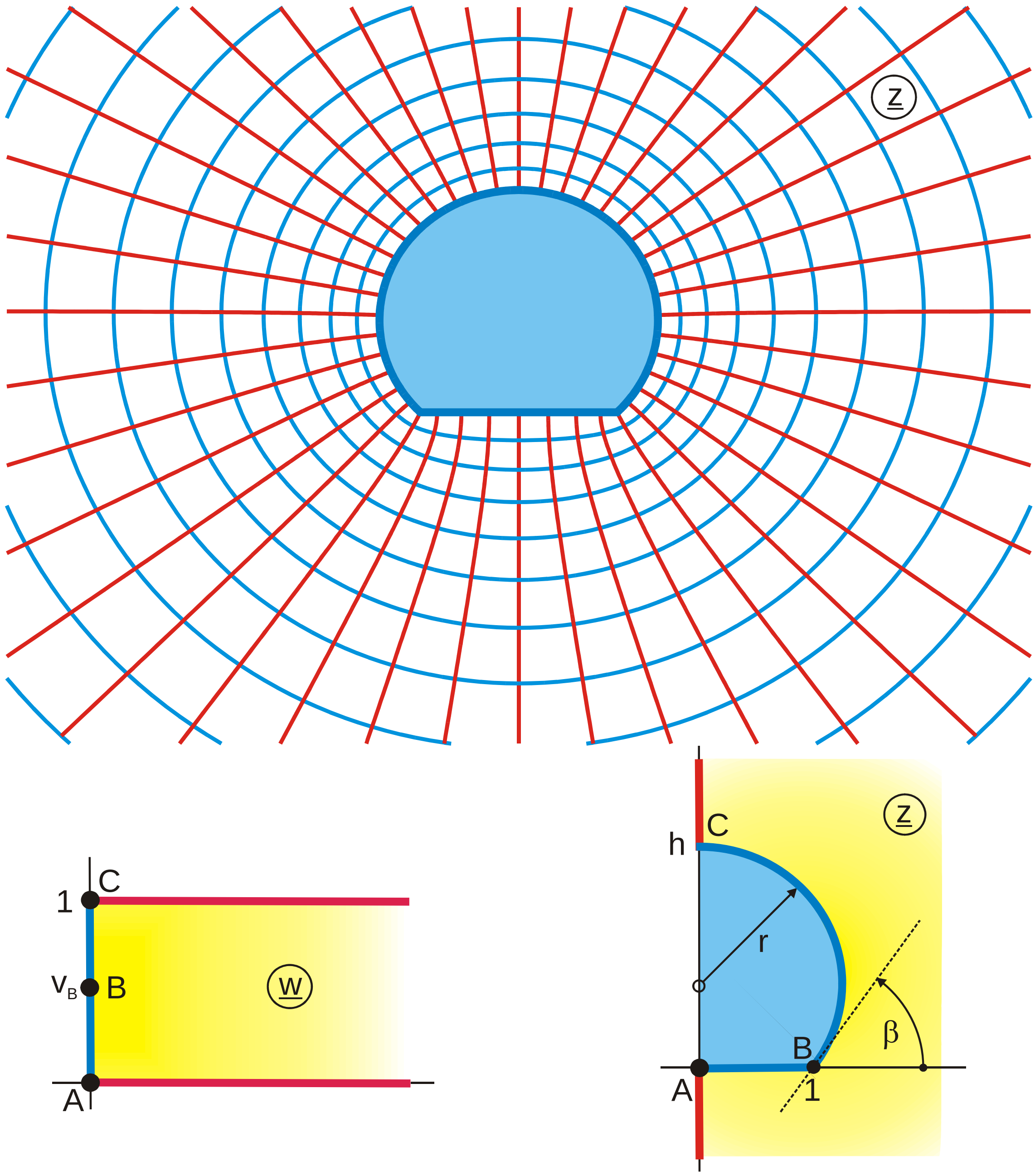


Abbildung B 3.1

$$z = \frac{1 - w_3}{1 + w_3} \qquad w_3 = \left(\frac{w_2 + 1}{w_2 - 1}\right)^{\alpha}$$

$$w_2 = ja\frac{1 + w_1}{1 - w_1} \qquad w_1 = \exp(w\pi)$$

$a = 1/\tan[\pi/\{2\alpha\}]$ $\qquad$ $\alpha = 1 + \beta/\pi$

$h = 1/\tan(\beta/2)$ $\qquad$ $r = 1/\sin\beta$

$\beta = 45°$ $\qquad$ $v_B = \frac{2}{\pi}\arctan a$

$0 \le u \le 0{,}5$ $\qquad$ $0 \le v \le 1$

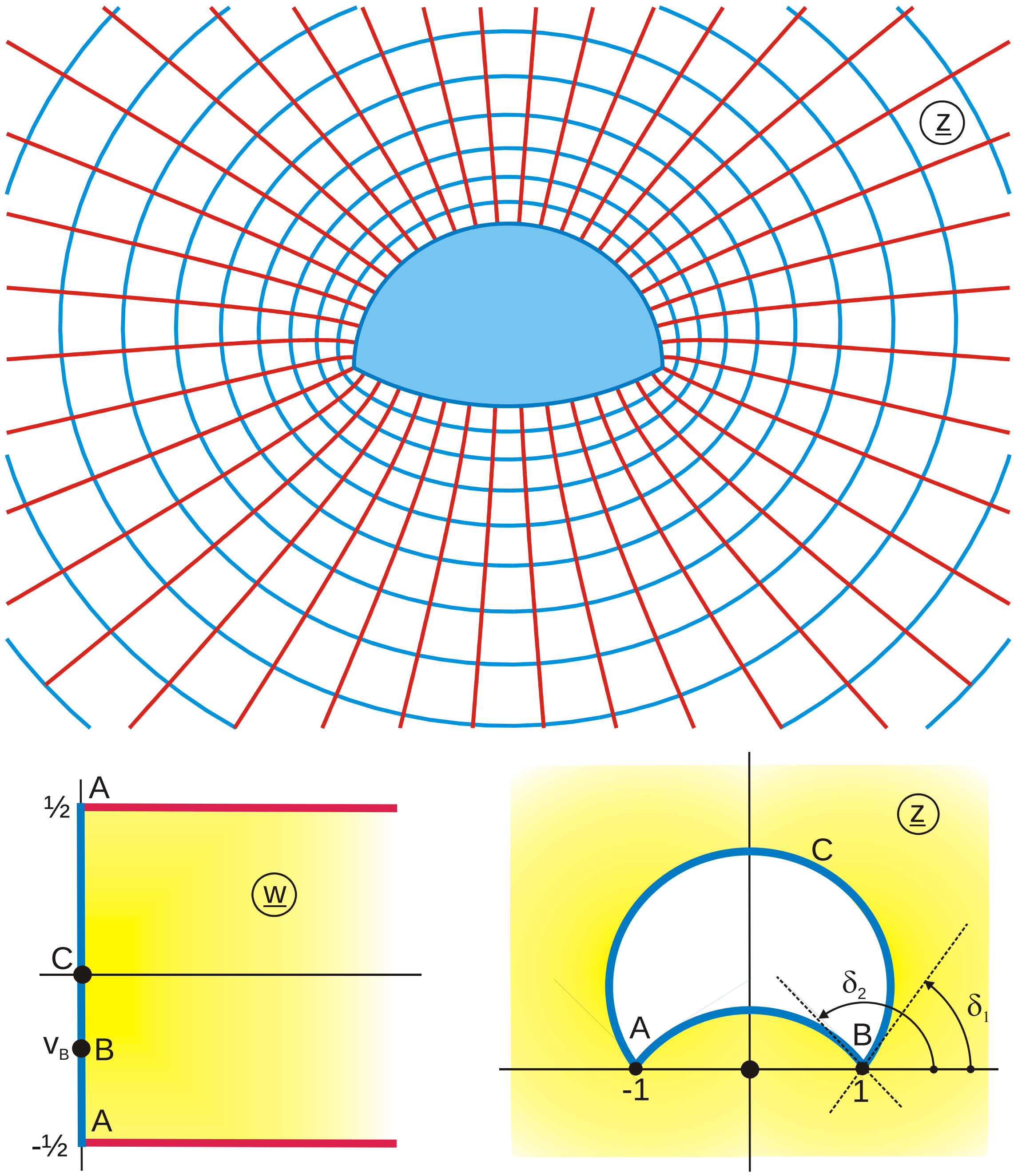


Abbildung B 3.2

$$z = \frac{1 + w_2}{1 - w_2}$$

$$v_B = \frac{1}{\pi} \arctan \frac{a}{b}$$

$$w_2 = e^{j\delta_2}\, w_1^{(2 - \delta_2/\pi + \delta_1/\pi)}$$

$$w_1 = a + jb \tanh(w\pi)$$

$$\varphi = \frac{2\pi - \delta_2}{2 - \delta_2/\pi + \delta_1/\pi}$$

$\delta_2 \geq \delta_1$

$a = \cos\varphi$

$b = \sin\varphi$

$0 \leq u \leq 0{,}25$

$-0{,}5 \leq v \leq 0{,}5$

$\delta_1 = 90°$

$\delta_2 = 210°$

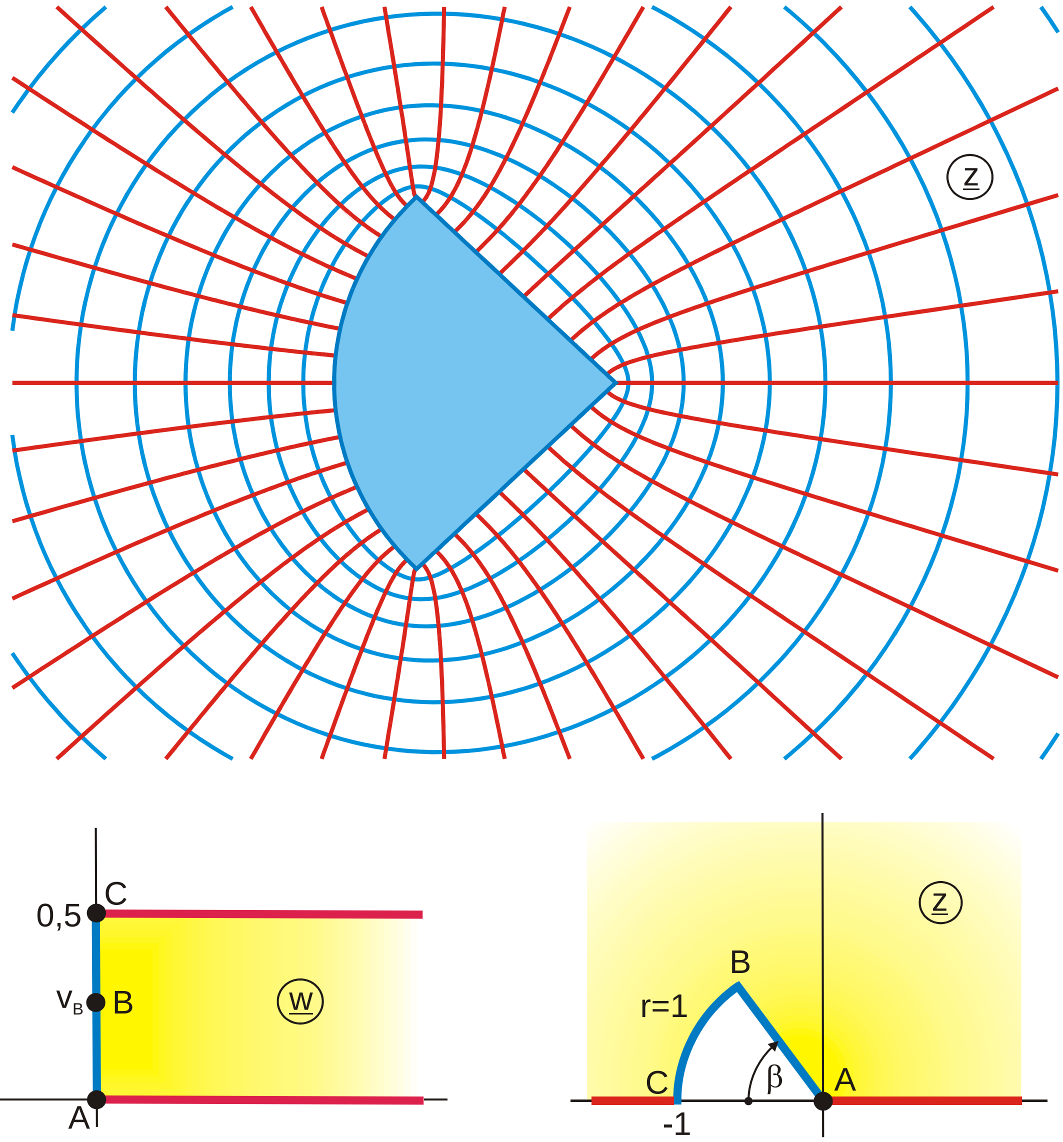


Abbildung B 3.3

$$z = \exp(2w_2)$$

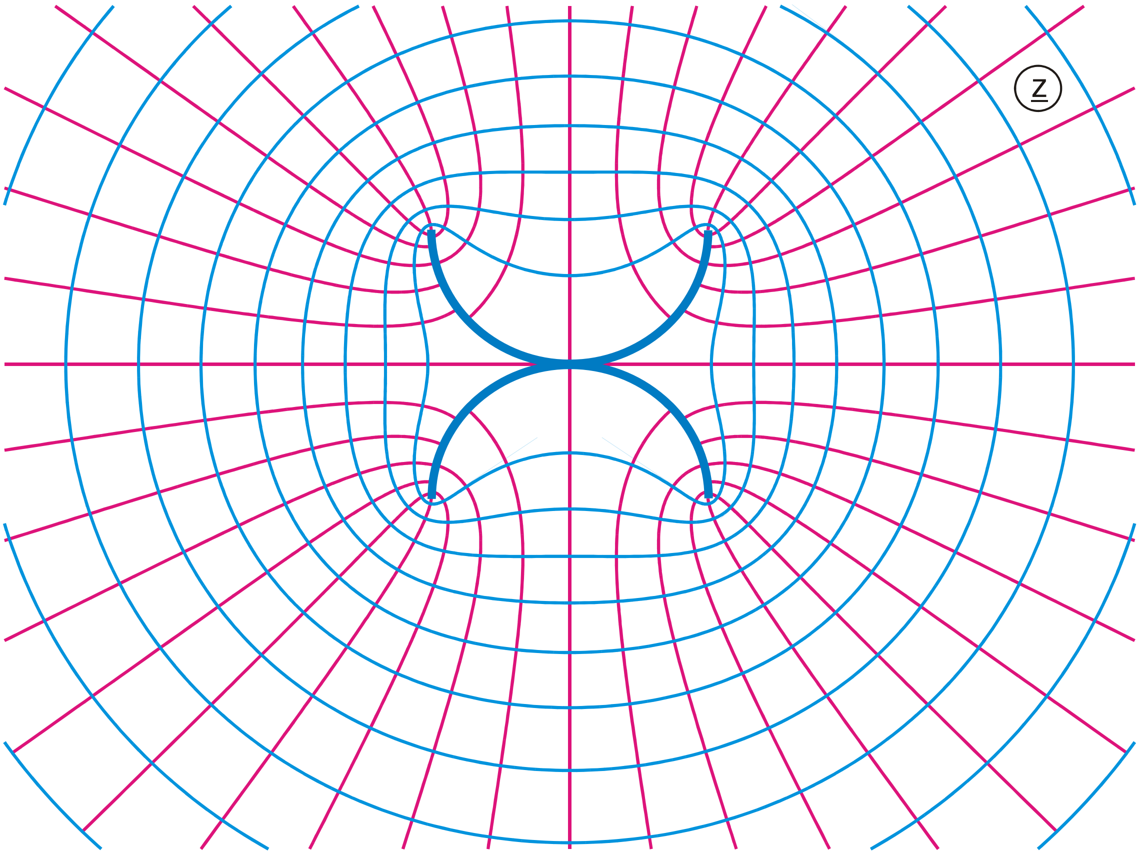
$$w_2 = \operatorname{ar\,cosh}\left(\frac{w_1}{a}\right) + b\,\operatorname{ar\,cosh}\left(\frac{w_1^2 c - a^2}{a^2(w_1^2 - 1)}\right) \qquad w_1 = \cosh(w\pi)$$

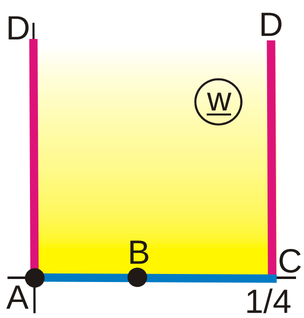
$$v_B = \frac{1}{\pi}\arccos a \qquad a = \sqrt{1 - (1 - \beta/\pi)^2}$$

$$b = \frac{\sqrt{1 - a^2}}{2} \qquad c = 2 - a^2$$

$0 \le u \le 1/4$ $\qquad$ $0 \le v \le 1/2$

$0 \le a \le 1$ $\qquad$ $\beta = 45°$





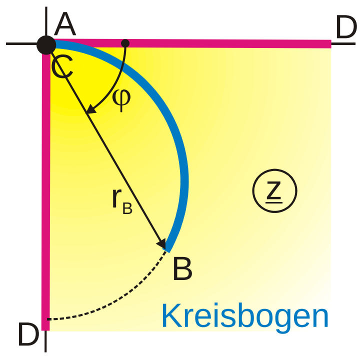


Abbildung B 3.4

$$z = \frac{1}{w_2}$$

$$w_2 = w_1 + a \tanh w_1$$

$$w_1 = j\pi/2 - \ln\tan(w\pi)$$

$$d = \operatorname{ar\,sinh}\sqrt{a} + \sqrt{a(a+1)}$$

$$r_B = \frac{1}{d + j\pi/2}$$

$$\varphi = \arg r_B$$

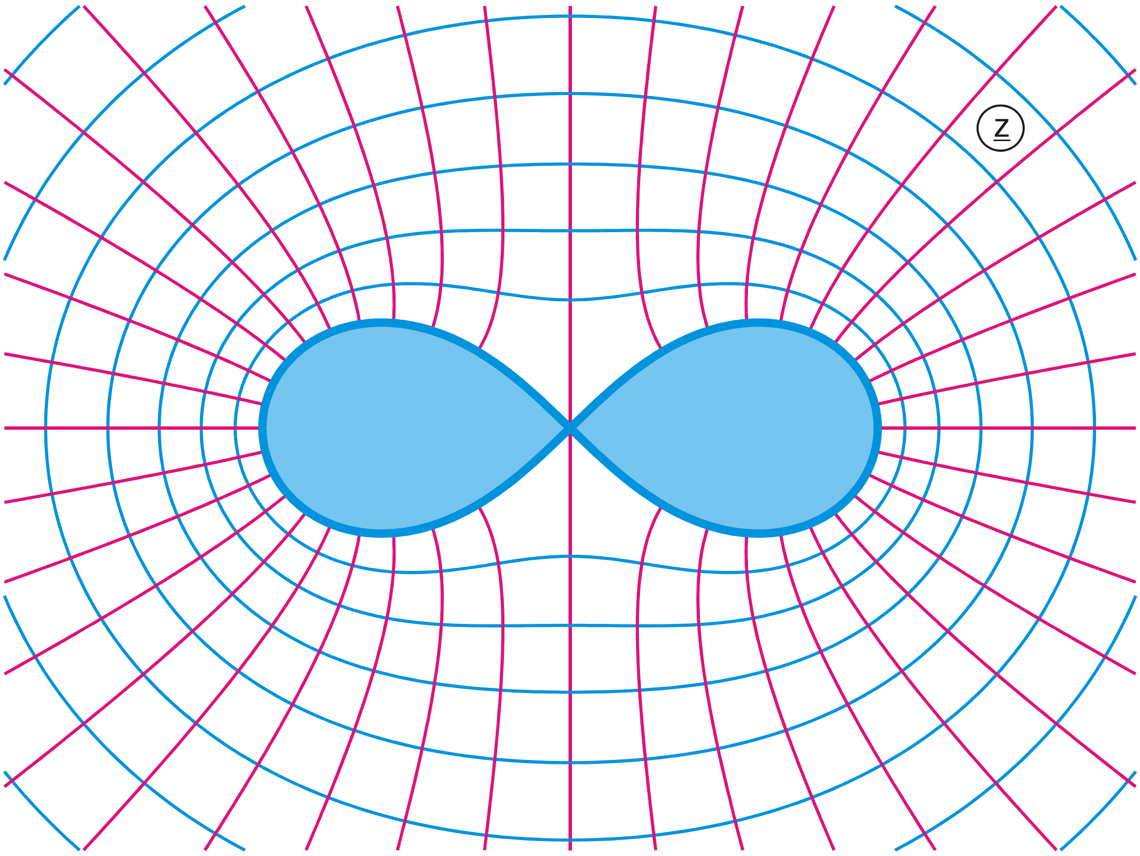
gegeben: a

$a = 0{,}527$ für $\varphi = -45°$

$$u_D = \frac{1}{\pi}\arctan\frac{1}{\sqrt{a} + \sqrt{1+a}}$$

$0 \le u \le 0{,}25$

$0 \le v \le 0{,}25$



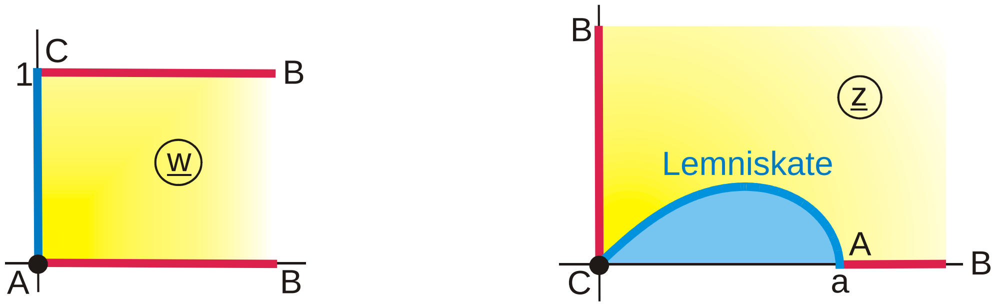


Abbildung B 3.5

$z = \sqrt{1 + w_1}$

$w_1 = \exp(\pi w)$

$a = \sqrt{2}$

$0 \le u \le 1$

$0 \le v \le 1$

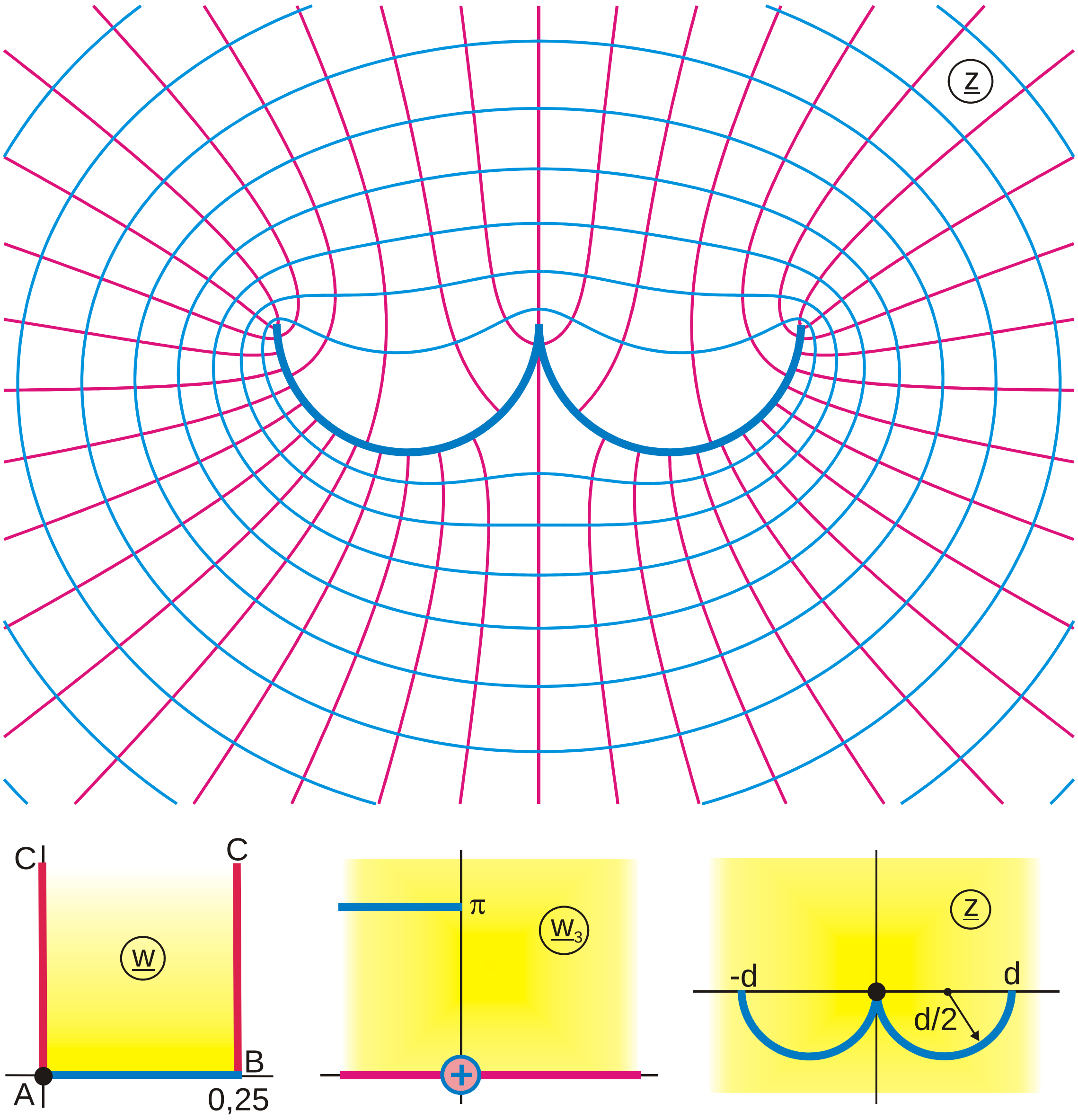


Abbildung B 3.6

$$z = \frac{1}{w_4} \exp\left(j\frac{\pi}{2} \right)$$

d = 1/π

$w_4 = w_3\pi + \exp(w_3\pi) + 1$

$w_3 = 2w_2$

$w_2 = j\frac{\pi}{2} - w_1$ - 0,63923

$w_1 = \ln \tan(w\pi)$

u ≤ 0,25

0 ≤ v ≤ 0,3

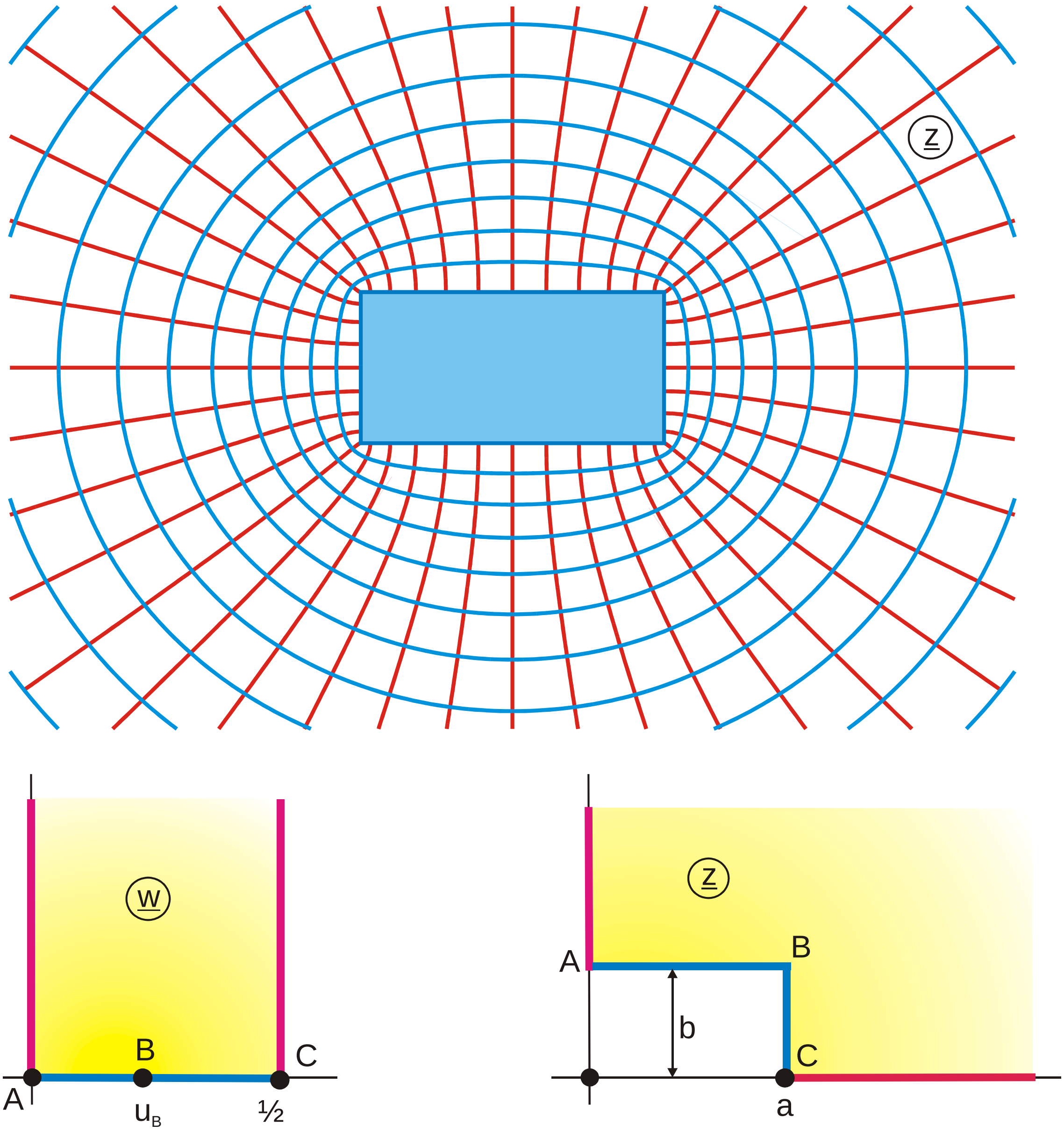


Abbildung B 4

$z = B_a(w_1,k) + jb$

$w_1 = \dfrac{\sin(\pi w)}{k}$ $\qquad$ $u_B = \dfrac{1}{\pi}\arcsin k$

$0 \le u \le 5$ $\qquad$ $0 \le v \le 0{,}47$

$b = \dfrac{E'}{k^2} - K'$ $\qquad$ $a = \dfrac{E - k'^2 K}{k^2}$

$k = 0{,}8$

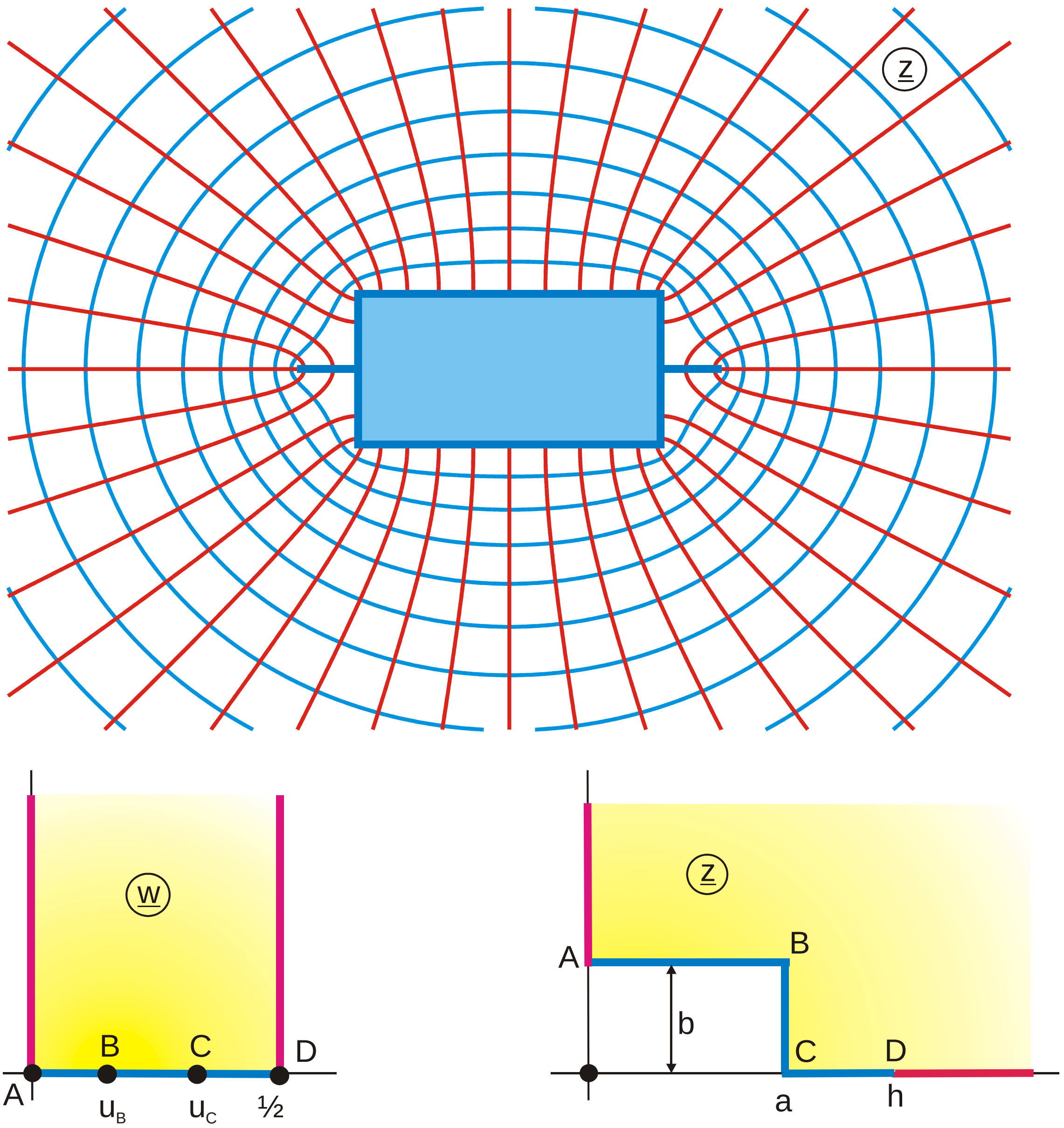


Abbildung B 4.1

$z = B_a(w_1,k) + jb$

$$w_1 = \frac{\sin(\pi w)}{\sigma}$$

$$u_B = \frac{1}{\pi}\arcsin\sigma$$

$$b = \frac{E'}{k^2} - K'$$

$$a = \frac{E - k'^2 K}{k^2}$$

$$u_C = \frac{1}{\pi}\arcsin\frac{\sigma}{k}$$

$\sigma \le k$, $h = 0$ für $\sigma = k$

$0 \le u \le 5$

$0 \le v \le 0{,}47$

$k = 0{,}8$

$\sigma = 0{,}7522$

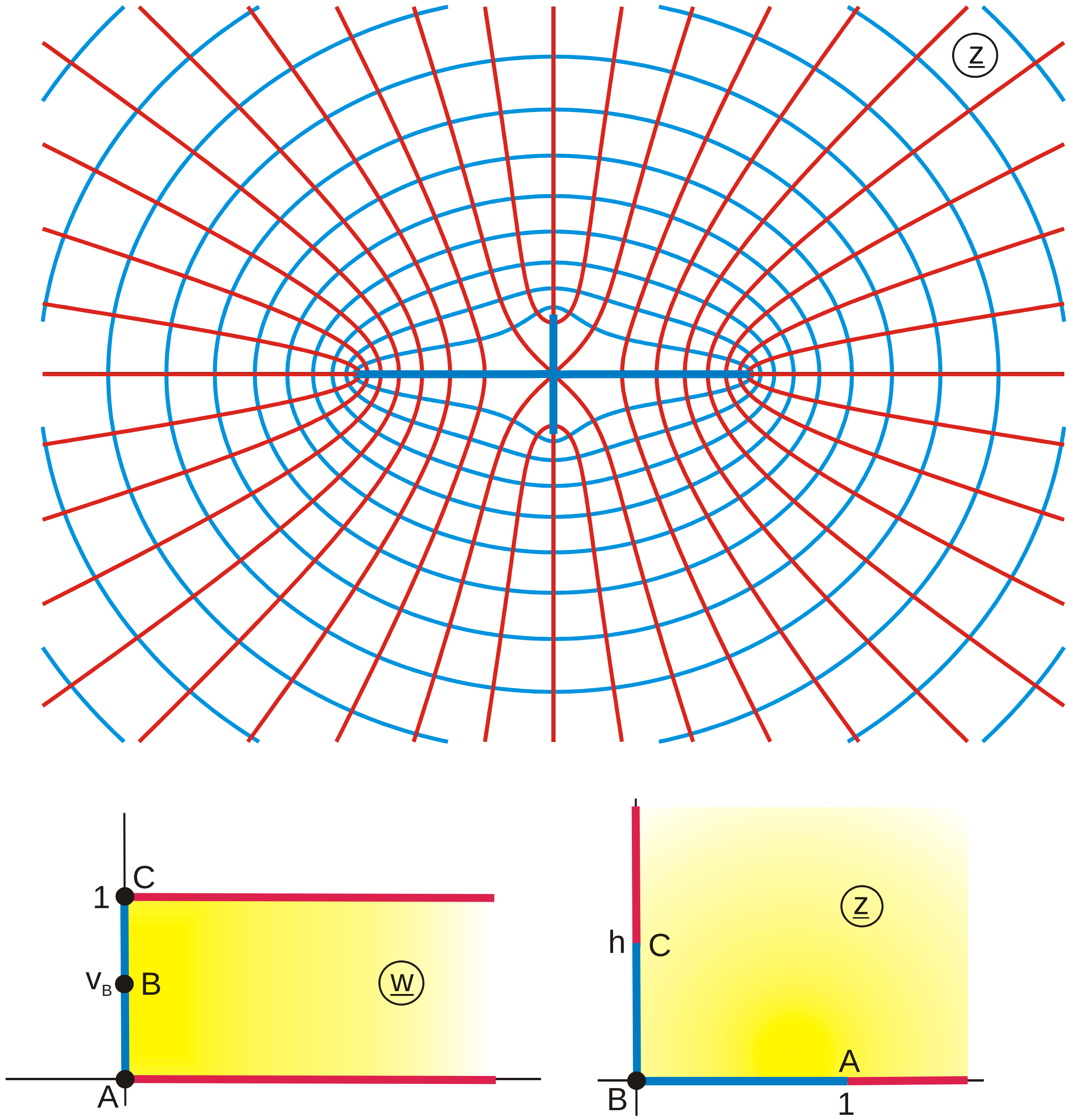


Abbildung B 5

$z = \sqrt{\dfrac{a + \cosh(\pi w)}{a + 1}}$ $\qquad$ $v_B = \dfrac{1}{\pi}\arccos(-a)$

$a = \dfrac{1 - h^2}{1 + h^2}$ $\qquad$ $0 \le a \le 1$

$0 \le u \le 1{,}2$ $\qquad$ $0 \le v \le 1$

$a = 0{,}809$ $\qquad$ $v_B = 0{,}2$

$h = 0{,}32493$

$a = 0$: $b = h = 1$ $\qquad$ $a = 1$: $b = \mathrm{sqr}(2)$, $h = 0$

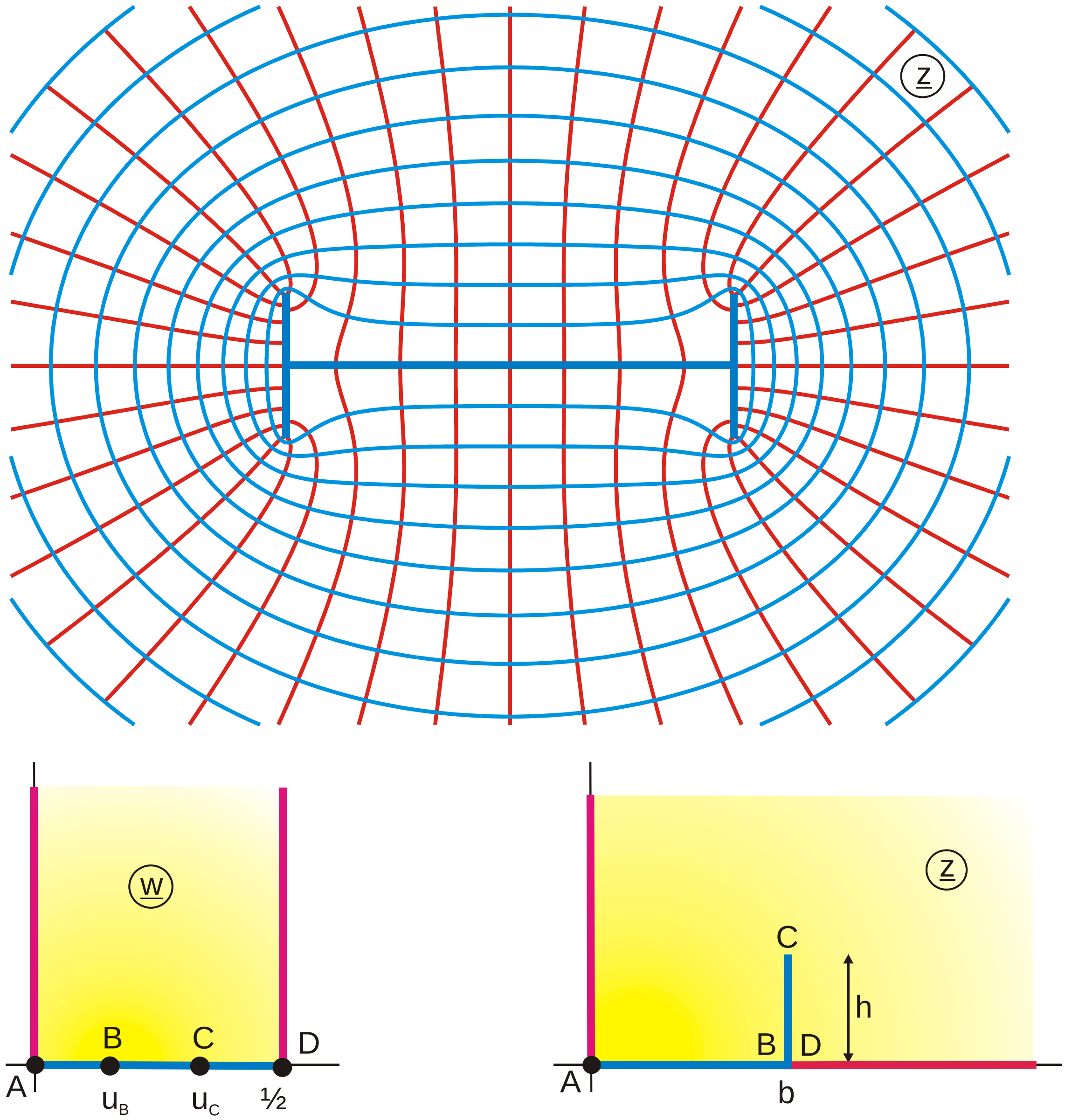


Abbildung B 5.1

$$z = Z_e(w_1, k) + \frac{\pi}{2KK'} w_1$$

$w_1 = F_a\,(w_0, k)$ $\qquad$ $w_0 = \dfrac{\sin(w\pi)}{k}$

$0 \le u \le 0{,}5$ $\qquad$ $0 \le v \le 0{,}4$ $\qquad$ $k = 0{,}5$

$a = \dfrac{1}{k}\sqrt{\dfrac{E'}{K'}}$ $\qquad$ $b = \dfrac{\pi}{2K'}$

$h = -Z_e(c, k') + \dfrac{\text{dn sn}}{\text{cn}}(c, k') - k^2 \dfrac{\text{sn}}{\text{cn dn}}(c, k')\, b = E(k)$ $\qquad$ mit $c = \text{Im}\{F_a(a,k)\}$

$u_B = \dfrac{1}{\pi}\arcsin k$ $\qquad$ $u_C = \dfrac{1}{\pi}\arcsin(ak)$

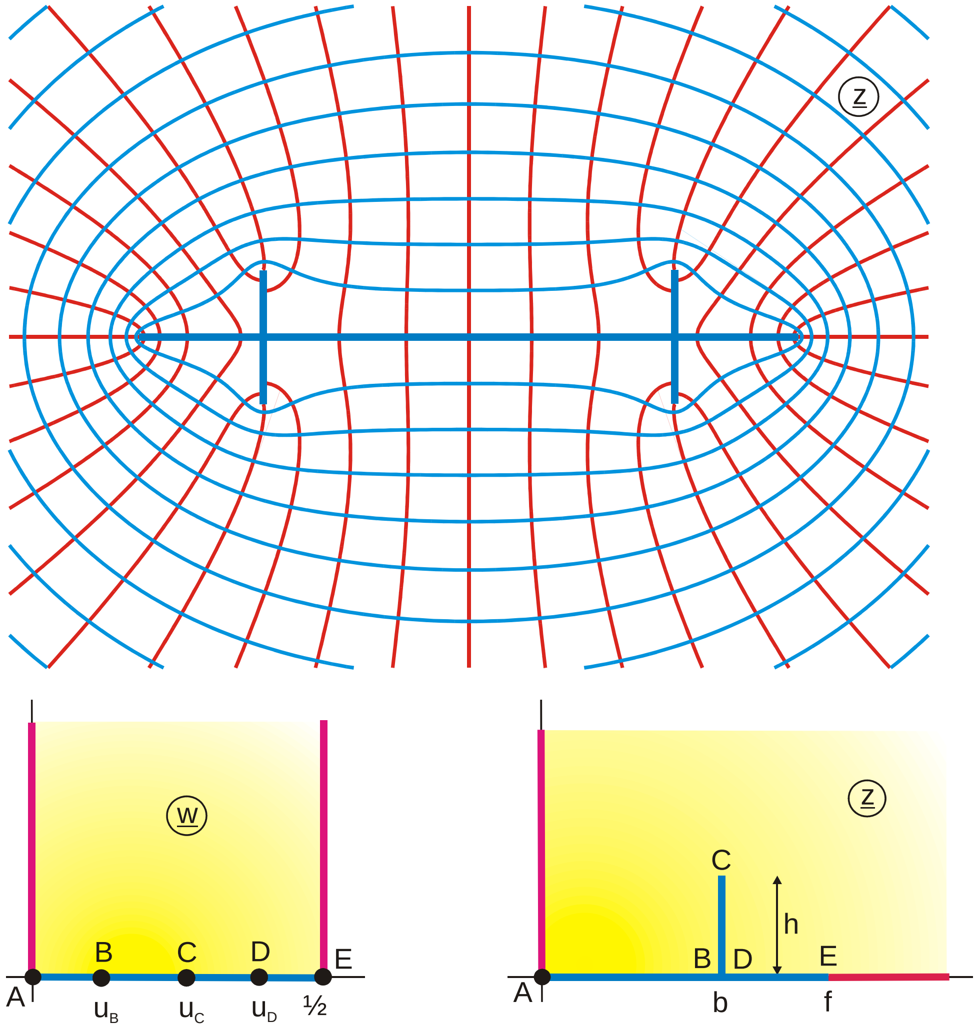


Abbildung B 5.2

$$z = Z_e(w_1,k) + \frac{\pi}{2KK'} w_1 \qquad \sigma < k$$

$$w_1 = F_a(w_0,k) \qquad w_0 = \frac{\sin(w\pi)}{\sigma}$$

$0 \le u \le 0{,}5$ $\quad \sigma = 0{,}4 \quad$ $0 \le v \le 0{,}4$ $\quad k = 0{,}5$

$$a = \frac{1}{k}\sqrt{\frac{E'}{K'}} \qquad b = \frac{\pi}{2K'}$$

$$h = -Z_e(c,k') + \frac{\text{dn sn}}{\text{cn}}(c,k') - k^2 \frac{\text{sn}}{\text{cn dn}}(c,k')\, b = E(k) \qquad \text{mit } c = \text{Im}\{F_a(a,k)\}$$

$$u_B = \frac{1}{\pi}\arcsin\sigma \qquad u_C = \frac{1}{\pi}\arcsin(a\sigma)$$

$$u_D = \frac{1}{\pi}\arcsin\frac{\sigma}{k} \qquad f = \text{Re}\left\{Z_e\left(\frac{1}{\sigma},k\right) + \frac{\pi}{2KK'}F_a\left(\frac{1}{\sigma},k\right)\right\}$$

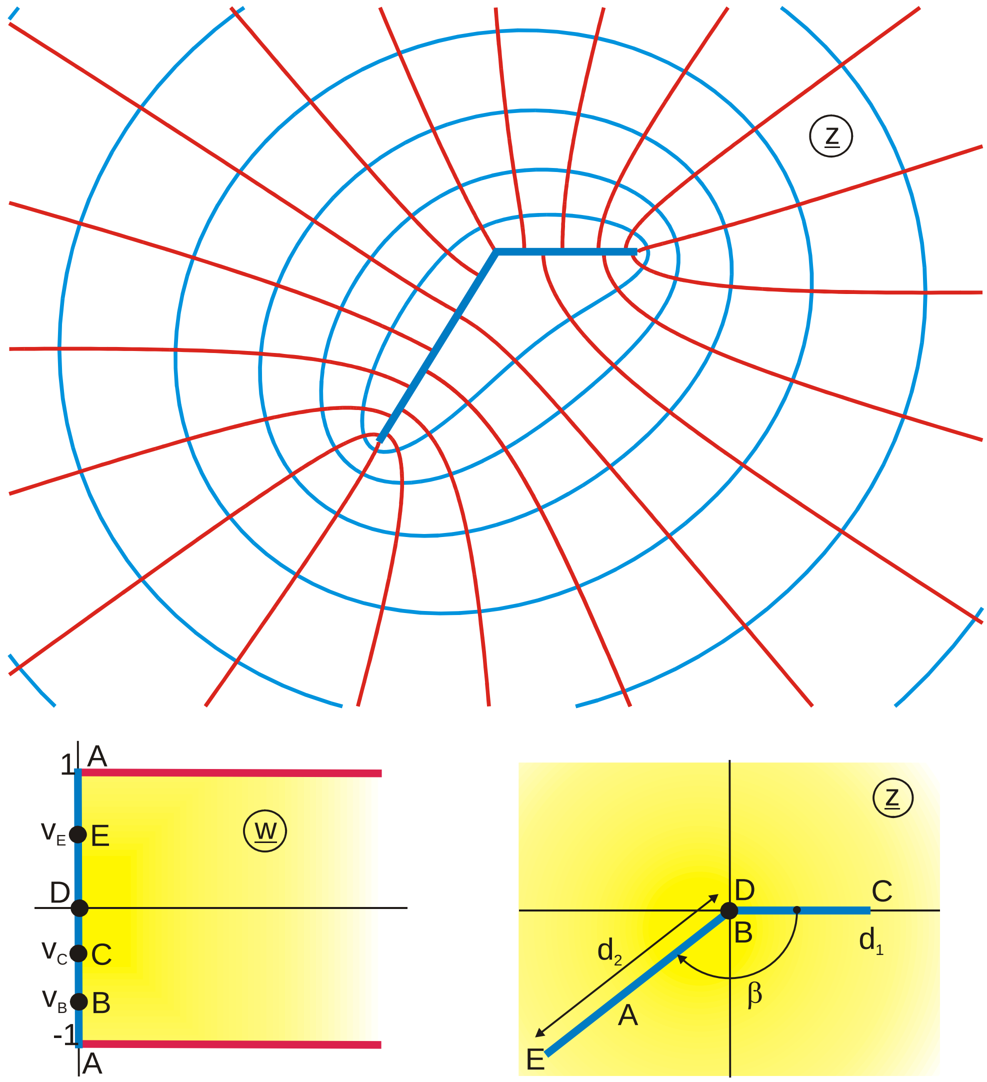


Abbildung B 5.3

$$z = w_1^{\,b} \Big/ \left(\frac{a}{b} - \frac{1-a}{1-b} w_1 \frac{1}{2-b} w_1^{\,2} \right) \qquad w_1 = p + jq \frac{1+w_0}{1-w_0}$$

$$w_0 = \exp(w\pi) \qquad b = \beta/\pi$$

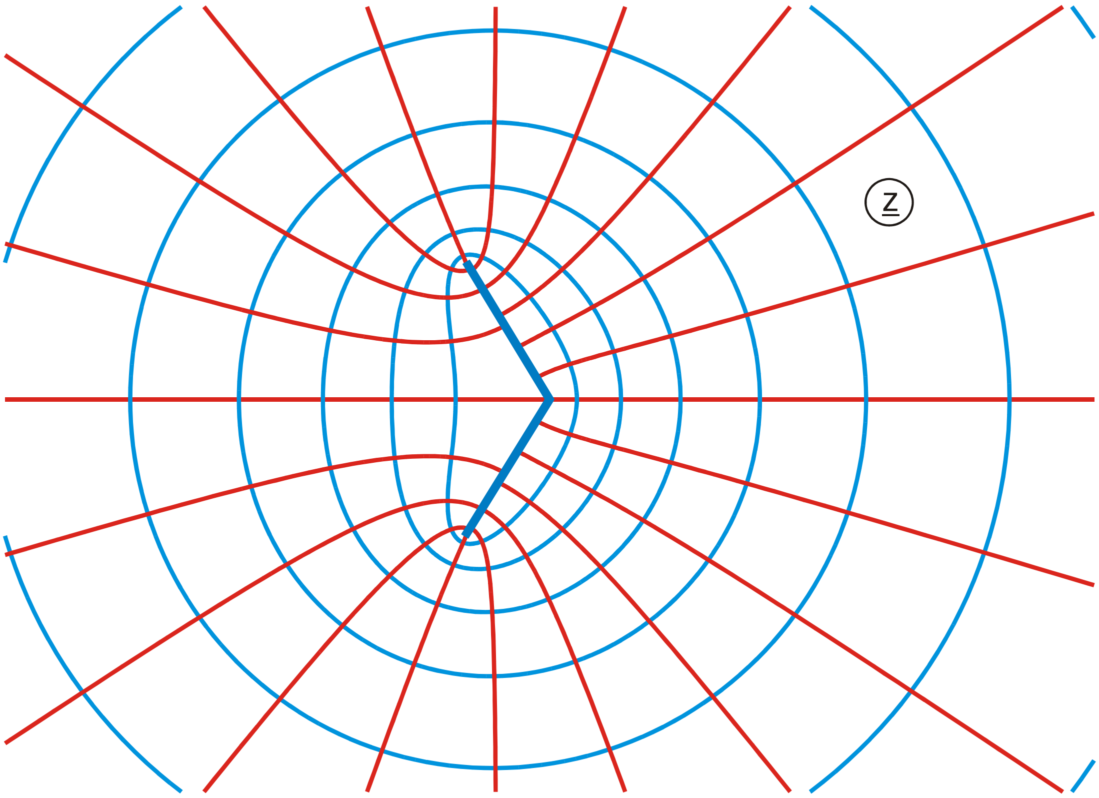
$$d_1 = \frac{1}{\dfrac{1}{2-b} + \dfrac{a-b}{b(1-b)}} \qquad d_2 = \frac{a^b(1-b)}{\dfrac{a}{b} - \dfrac{a^2}{2-b}}$$

$$p = \frac{(a-1)(b-2)}{2(1-b)} \qquad q = \sqrt{\frac{a(2-b)}{b} - p^2}$$

$$v_C = -\frac{2}{\pi}\arctan\left(\frac{q}{1-p}\right) \qquad v_E = \frac{2}{\pi}\arctan\left(\frac{q}{a-p}\right)$$

$0 \le u \le 0{,}5$ $\quad$ $a = 1{,}2$ $\quad$ $-1 \le v \le 1$ $\quad$ $\beta = 120°$

q reell, $\quad$ $d_2 > 0$ $\quad$ $d_1 > 0$



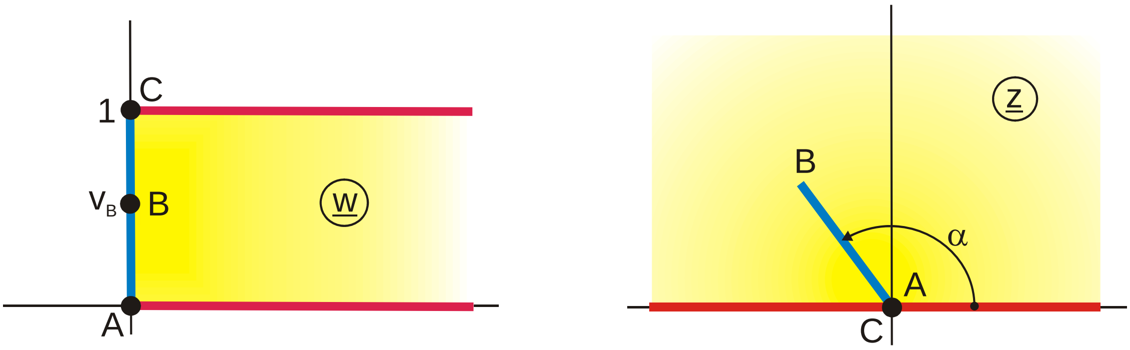


Abbildung B 5.4

$$z = (w_2 - 1)^{\alpha/\pi}(aw_2 + 1)^{1-\alpha/\pi}$$

$$w_2 = \frac{1}{2}(1+b)(1+w_1) - b$$

$$w_1 = \cosh(w\pi)$$

gegeben: α

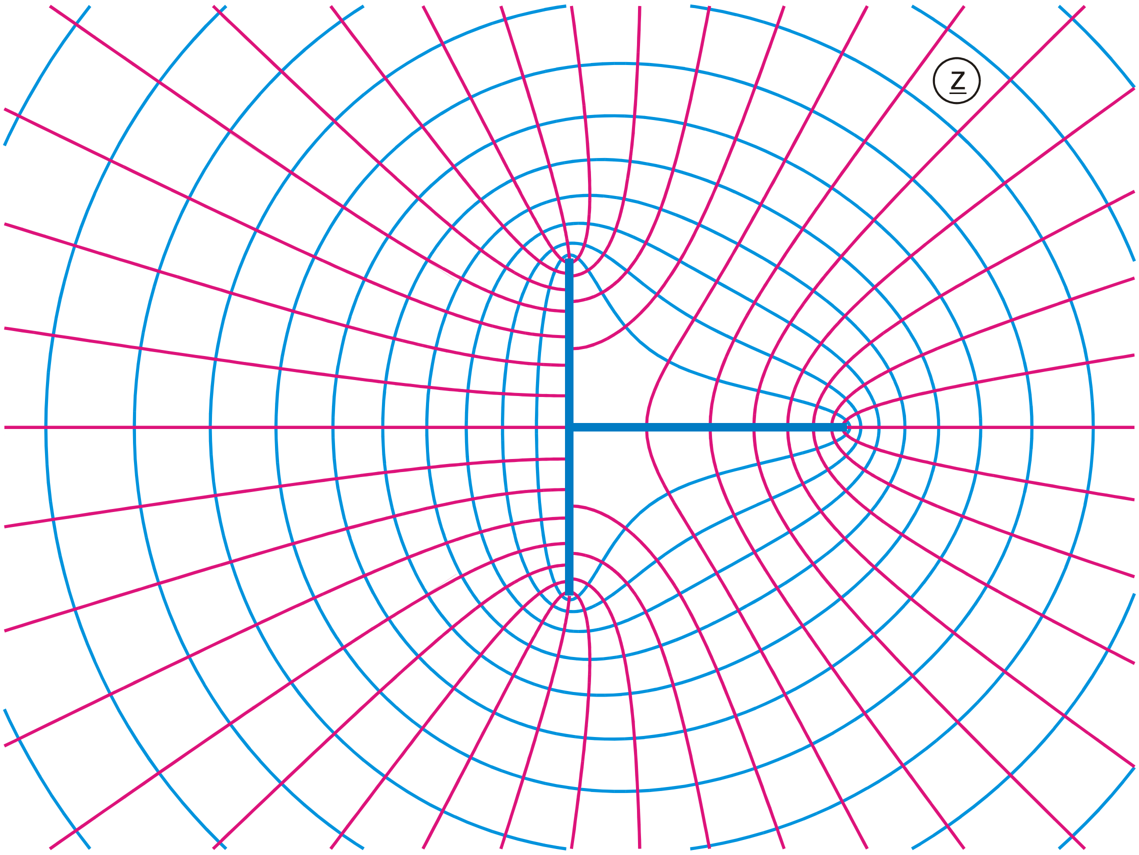
$$a = \frac{\alpha}{\pi - \alpha}$$

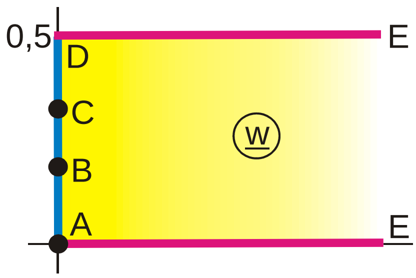
$b = 1/a$

$$v_B = \frac{1}{\pi}\arccos\left(\frac{b-1}{b+1}\right)$$

$0 \le u \le 0{,}8$

$0 \le v \le 1$





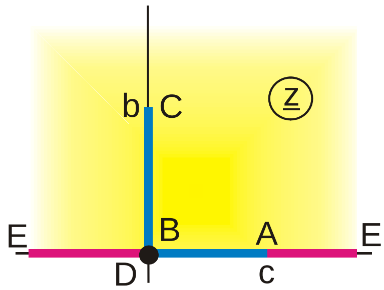


Abbildung B 5.5

$z = jw_1\sqrt{1 - w_1^2}$

$a > 0{,}5$: $c = 0$ für $a = 0{,}5$

$w_1 = a\,(w_0 + 1/w_0)$

$w_0 = \exp(w\pi)$

$0 \le u \le 0{,}3$

$0 \le v \le 0{,}5$

$v_B = \frac{1}{\pi}\arccos\left(\frac{1}{2a}\right)$

$h = 1\Big/\left(2a + \sqrt{4a^2 - 1}\right)$

Abbildungen Gruppe C

Zwei unendlich ausgedehnte Elektroden, symmetrisch angeordnet, entgegengesetzt gleich große Ladung

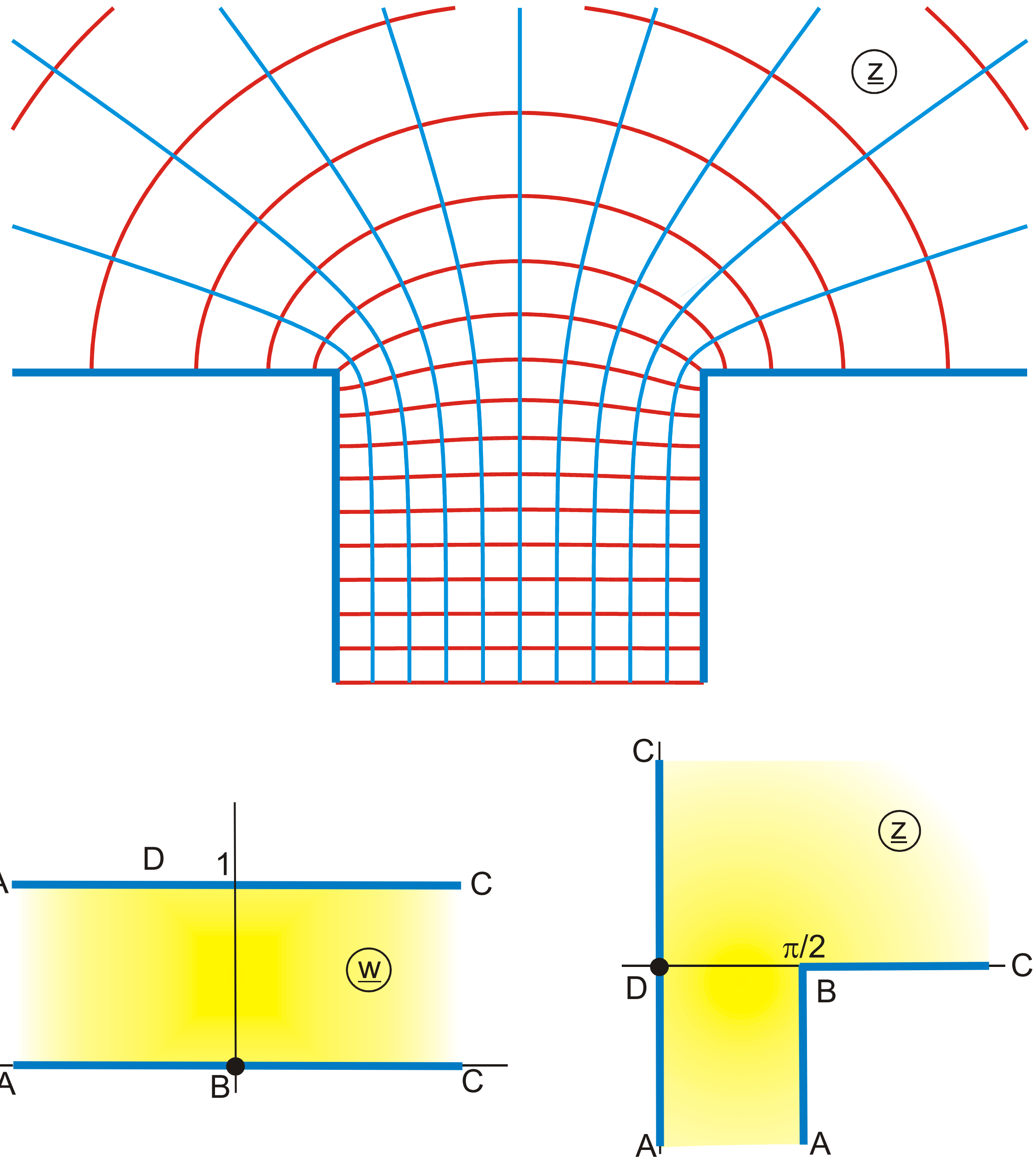


Abbildung C 1

$$z = \sqrt{w_1 - 1} - \arctan\sqrt{w_1 - 1} + \pi/2$$

$w_1 = \exp(w\pi)$

$-2 \le u \le 2$ $\qquad$ $0 \le v \le 1$

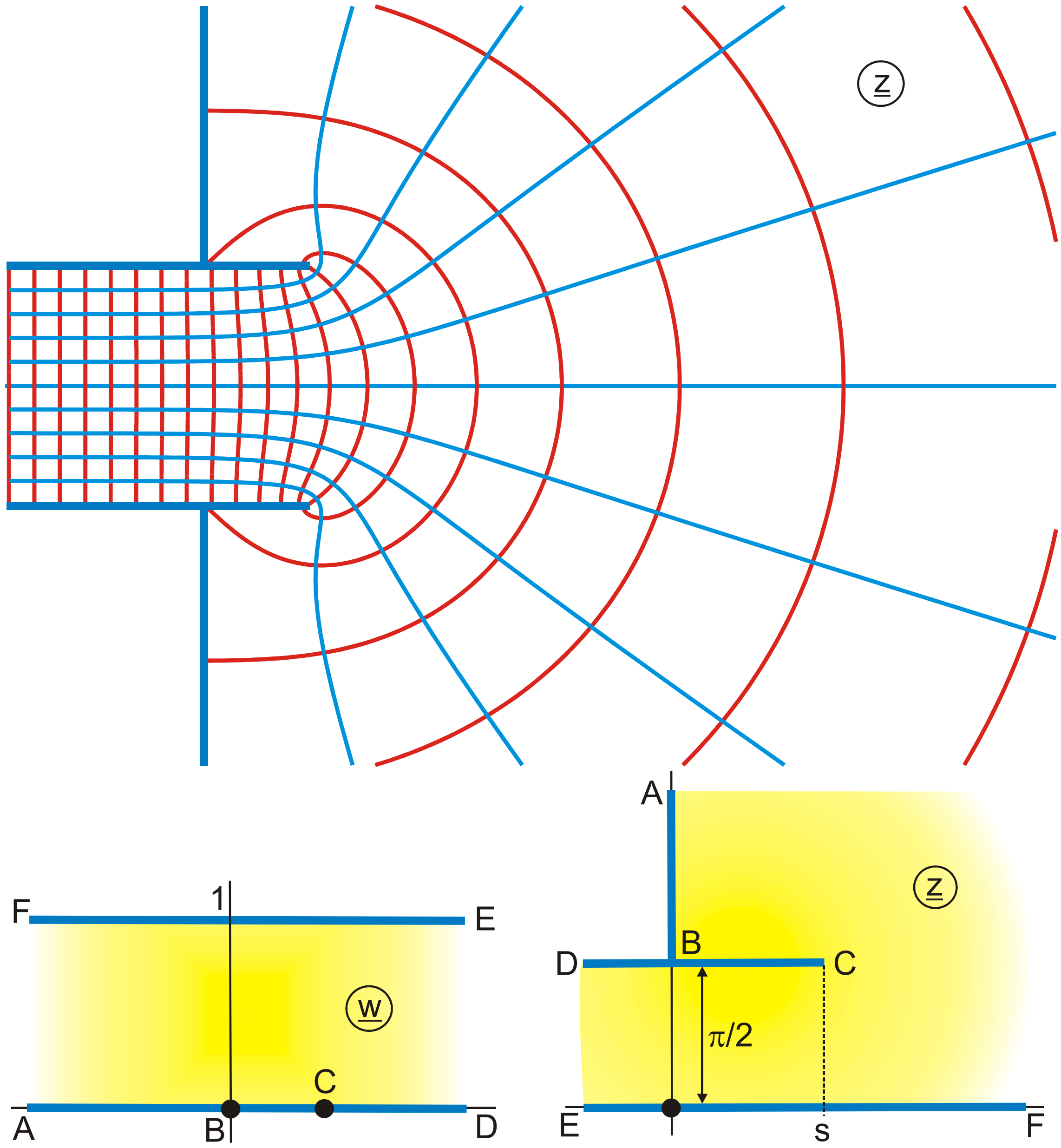


Abbildung C 1.1

$$z = -\operatorname{ar}\cosh\sqrt{w_1} + a\sqrt{1-1/w_1} + j\pi/2$$

$w_1 = \exp(\pi w)$

$s = -\operatorname{ar}\cosh\sqrt{a} + a\sqrt{1-1/a}$

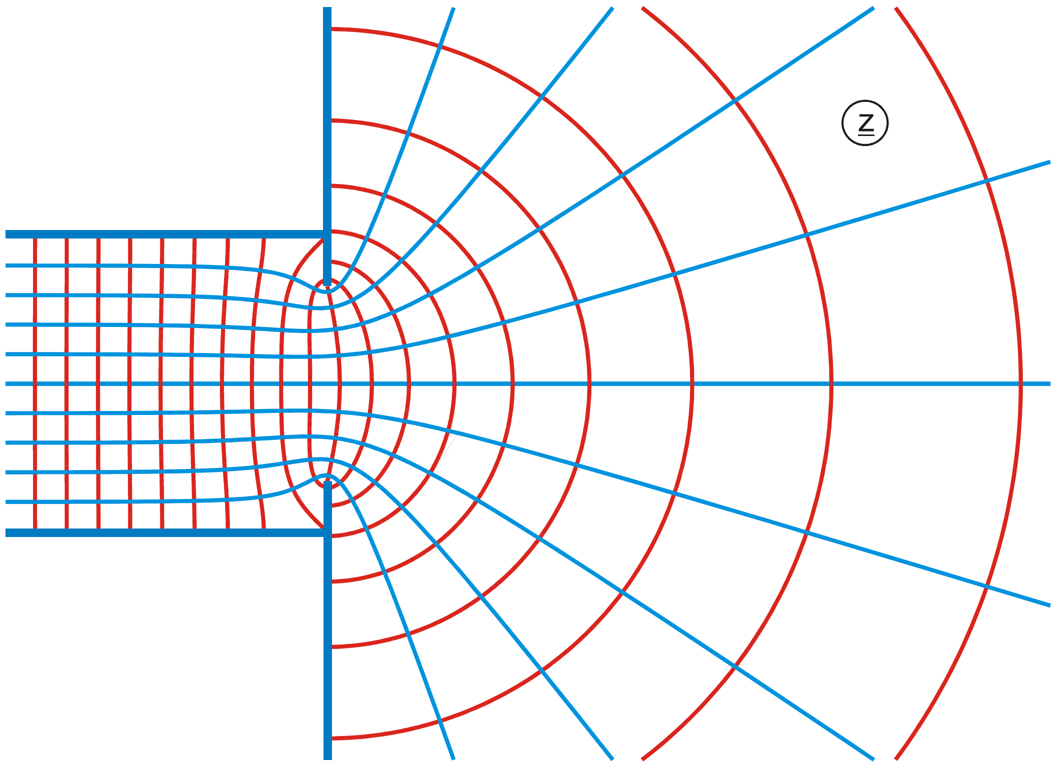
$a \geq 1$

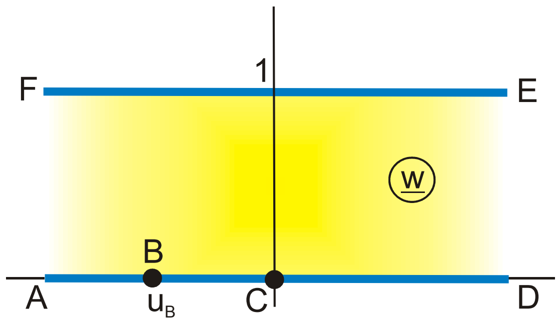
$u_C = \dfrac{1}{\pi}\ln a$

$-1 \leq u \leq 3$

$0 \leq v \leq 1$

$s = 0$ für $a = 1$





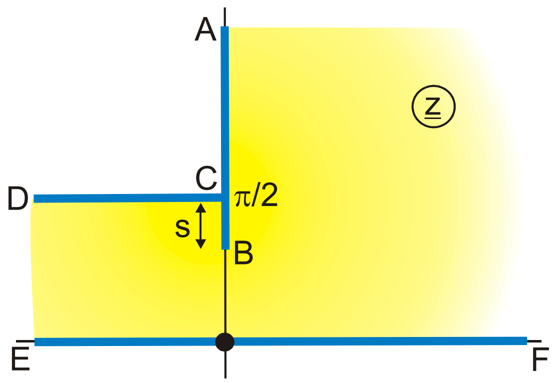


Abbildung C 1.2

$$z = -\operatorname{ar}\cosh\sqrt{w_1} + a\sqrt{1-1/w_1} + j\pi/2$$

$w_1 = \exp(\pi w)$

$0 < a \leq 1$

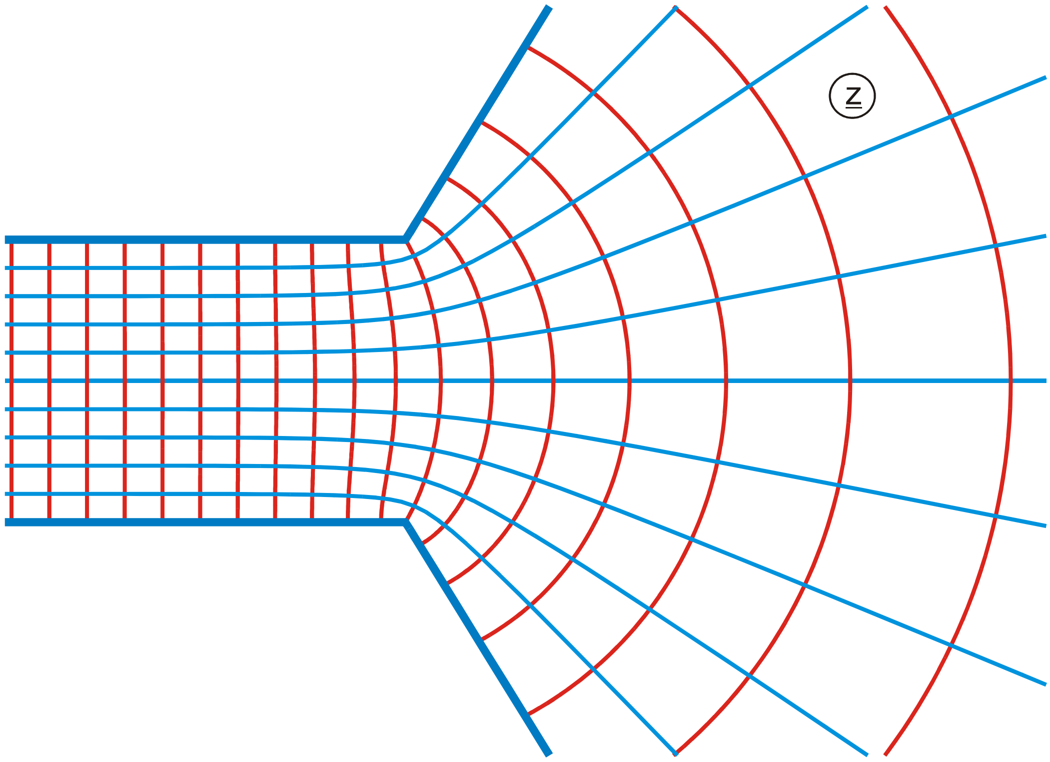
$-3 \leq u \leq 2$

$s = 0$ für $a = 1$

$s = \arccos\sqrt{a} - a\sqrt{1/a-1}$

$u_B = \dfrac{1}{\pi}\ln a$

$0 \leq v \leq 1$



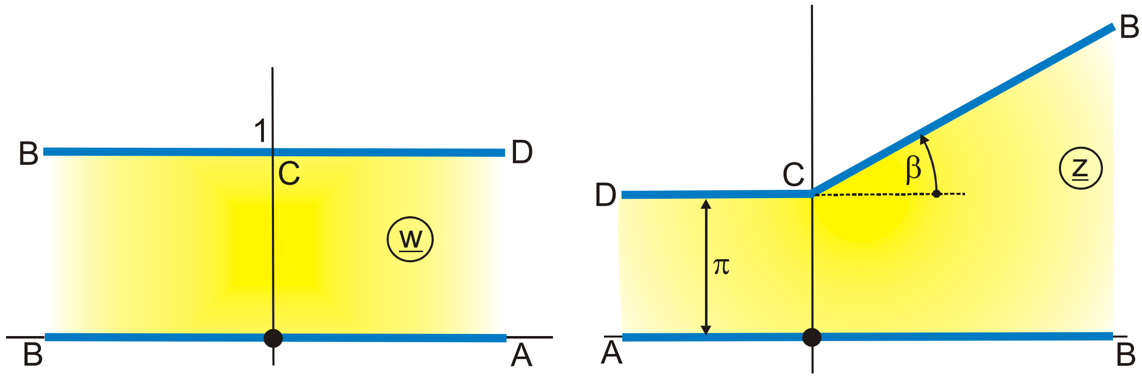


Abbildung C 1.3

$$z = \frac{q}{p} w_1{}^p + \sum_{i=0}^{q-1} \left[w_i{}^p \ln\left(1 - \frac{w_1}{w_i}\right)\right] + j\pi$$

$$w_1 = [1 - \exp(-w\pi)]^{1/q}$$

$$w_i(i) = \exp\left(\frac{j2\pi i}{q}\right)$$

$0 < \beta \leq \pi$

p, q: >0 und ganzzahlig

$-1{,}5 \leq u \leq 3{,}5$

$0 \leq v \leq 1$

$\beta = \pi\ p/q$

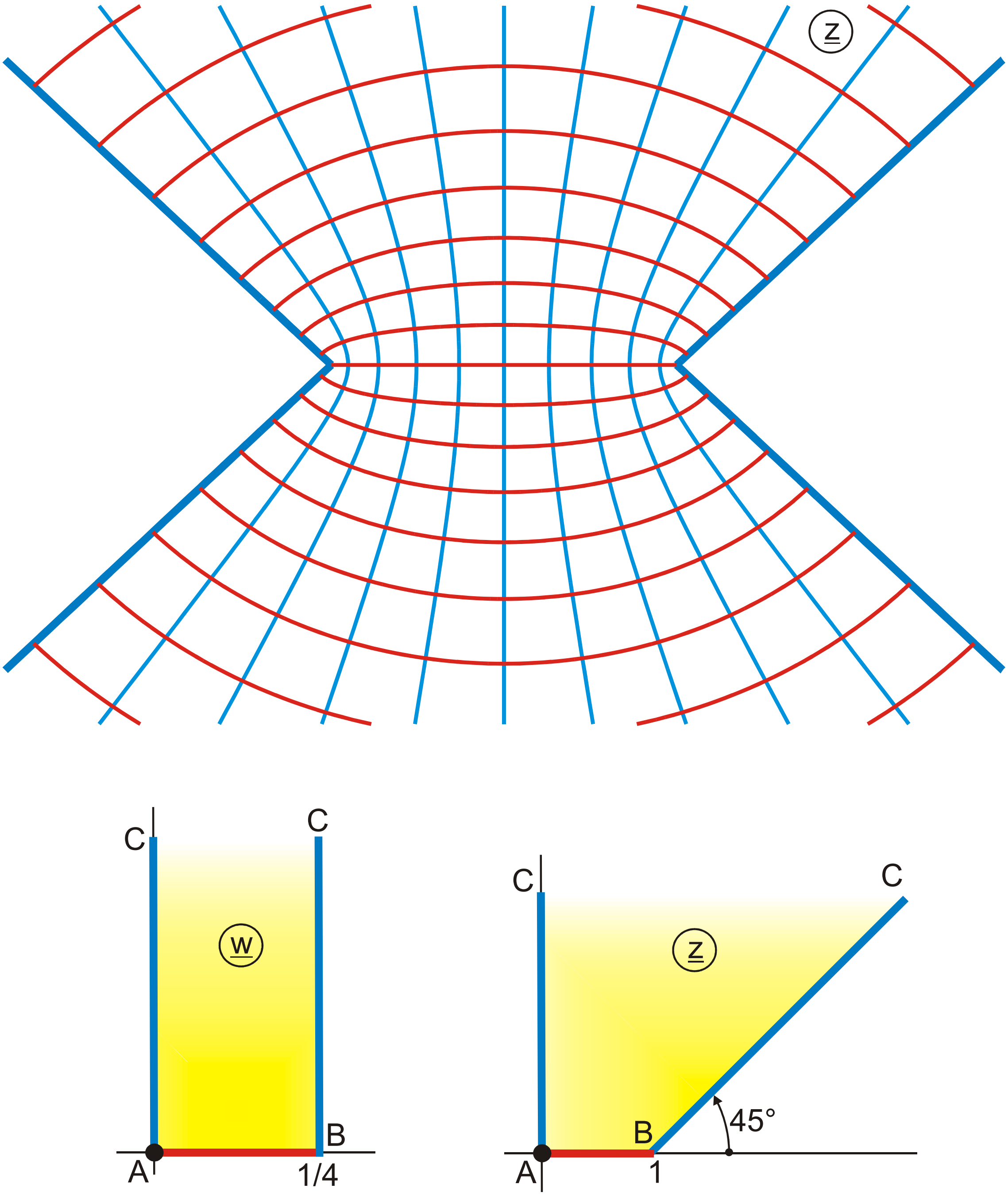


Abbildung C 1.4

$$z = \frac{1}{a} B_a \left\{ \frac{\sin(w\pi)}{k}, k \right\}$$

k = 1/sqr(2)

a = 2 E(k) - K(k)

$0 \leq u \leq 0{,}25$

$0 \leq v \leq 0{,}47$

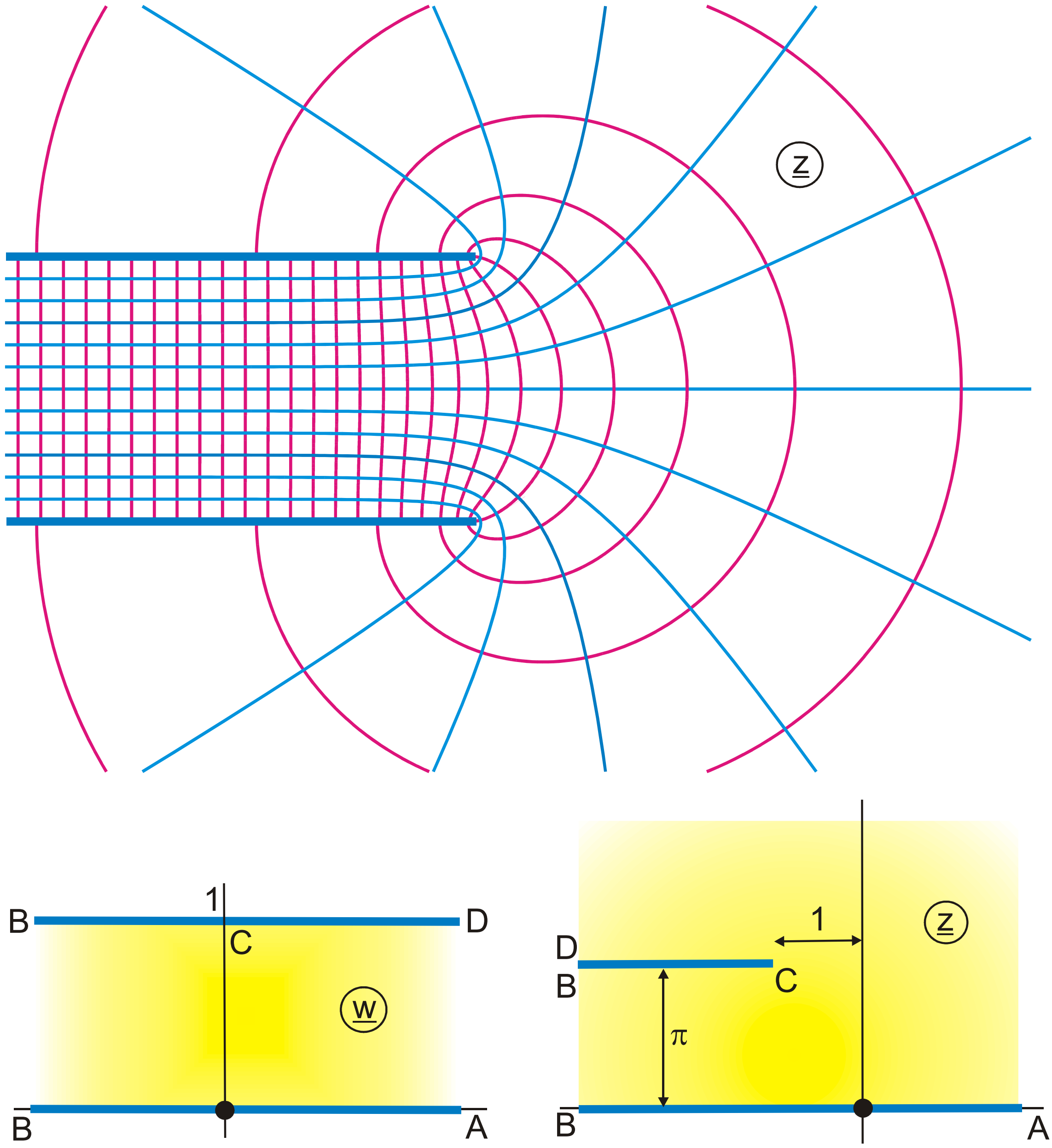


Abbildung C 2 (Maxwell-Kurven; Mittellinie v = 0,5: Rogowski-Profil)

$z = w_1 + \ln w_1$ $w_1 = \exp(\pi w)$

bzw.: $z = w\pi + \exp(w\pi)$

$-4 \leq u \leq 1$ $0 \leq v \leq 1$

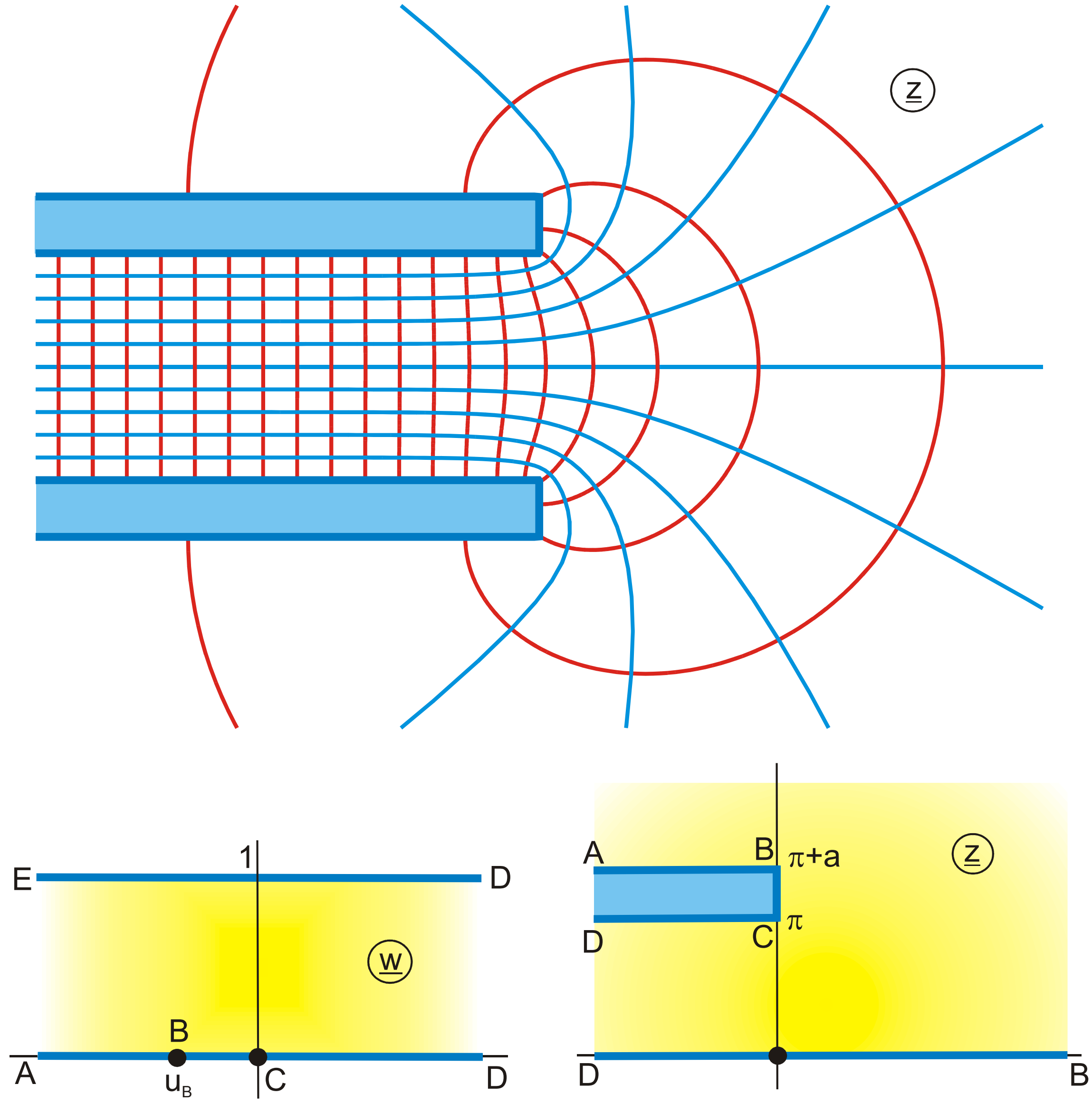


Abbildung C 2.1

$$z = \frac{w_1 w_2}{\exp(\pi w)} - 2\operatorname{artanh}\left(\frac{w_1}{w_2}\right) + 2b\operatorname{artanh}\left(\sqrt{\lambda}\,\frac{w_1}{w_2}\right) + j\pi$$

$w_1 = \sqrt{\exp(w\pi) - 1}$

$w_2 = \sqrt{\exp(w\pi) - \lambda}$

$a = \pi\,(b - 1)$

$b > 1$

$\lambda = \left(b + \sqrt{b^2 - 1}\right)^2$

$u_B = \frac{1}{\pi}\ln\lambda$

$-2 \le u \le 5$

$0 \le v \le 1$

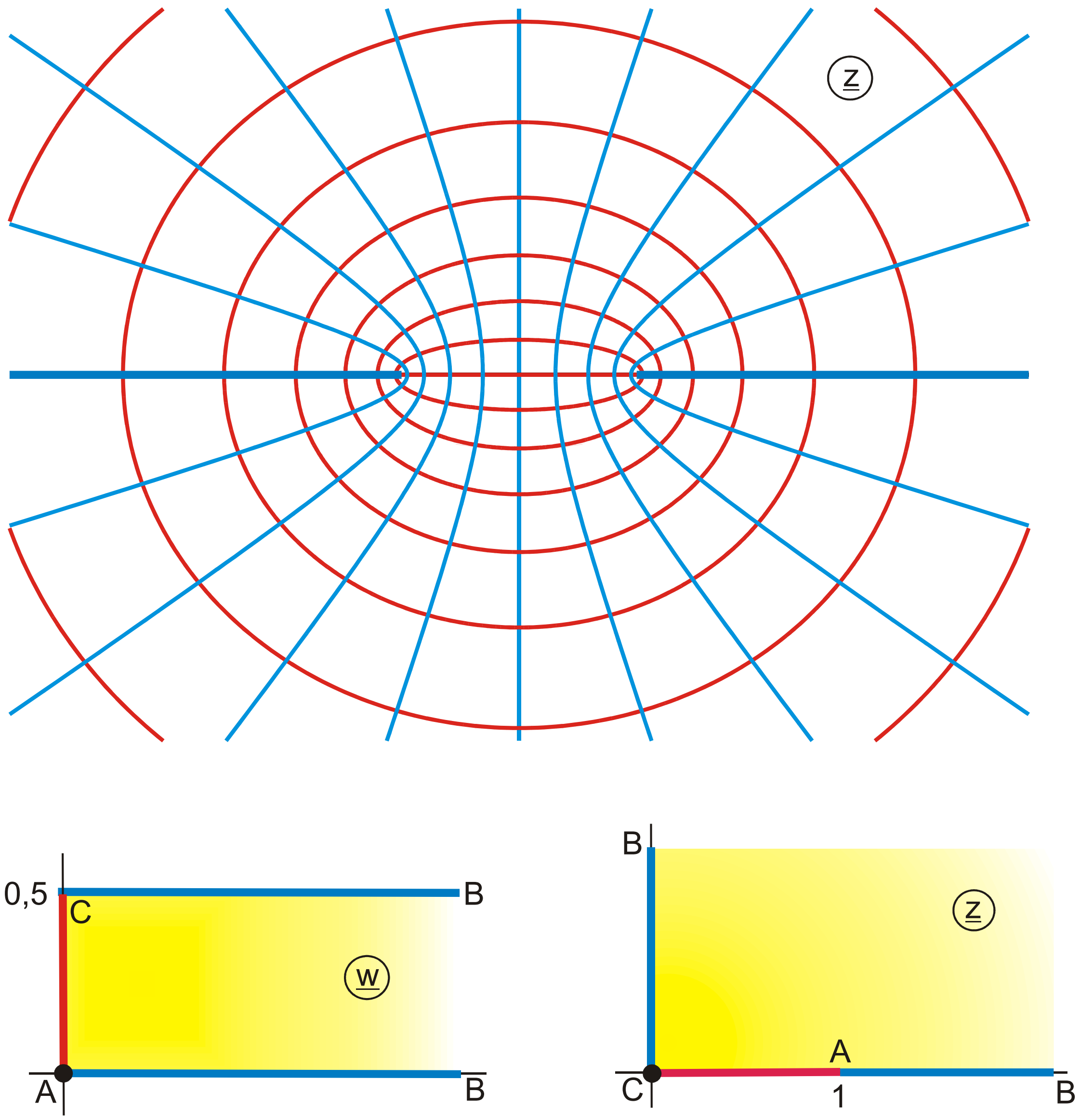


Abbildung C 3

$z = \cosh(\pi w)$

$0 \leq u \leq 1$ $0 \leq v \leq 0{,}5$

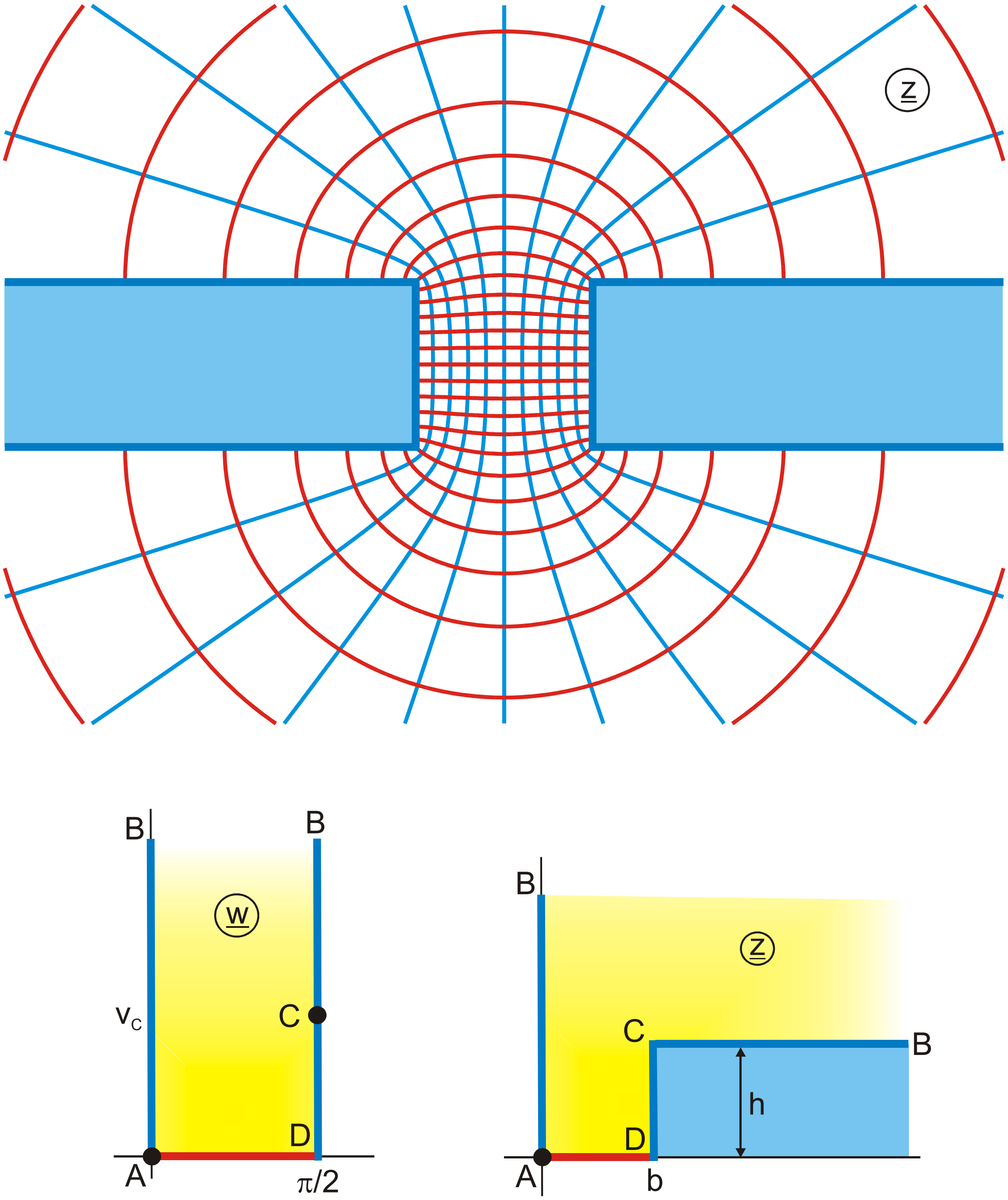


Abbildung C 3.1

$z = E_t(w,k)$

$b = E(k)$ $\qquad$ $h = K'(k) - E'(k)$

$v_C = \text{arcosh}(1/k)$

$0 \leq u \leq 3\pi/2$ $\qquad$ $0 \leq v \leq \pi/2$

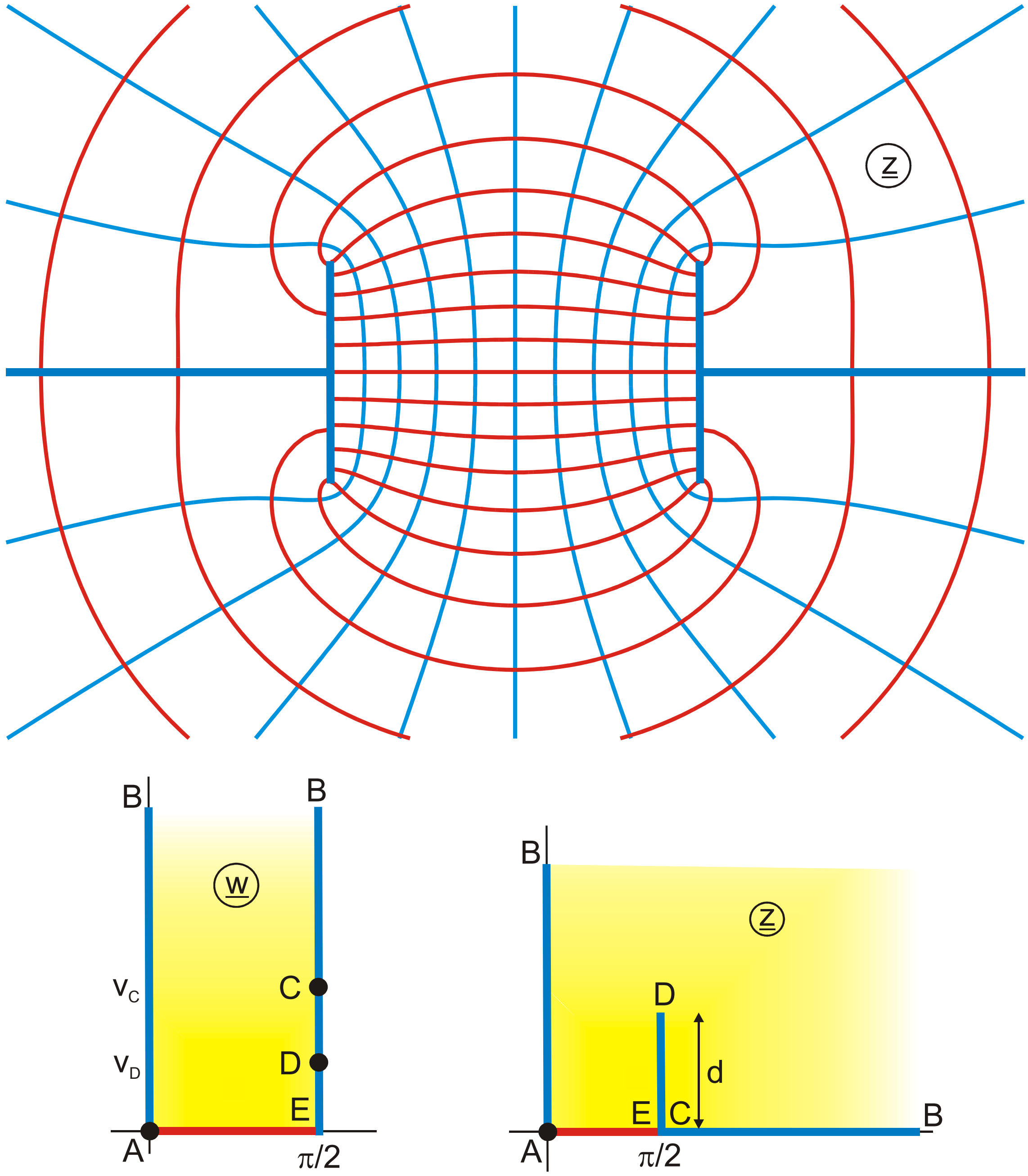


Abbildung C 3.2

$z = K\,E_t(w,k') - (K-E)\,F_t(w,k')$

bzw.: $z = \Lambda(w,k)$

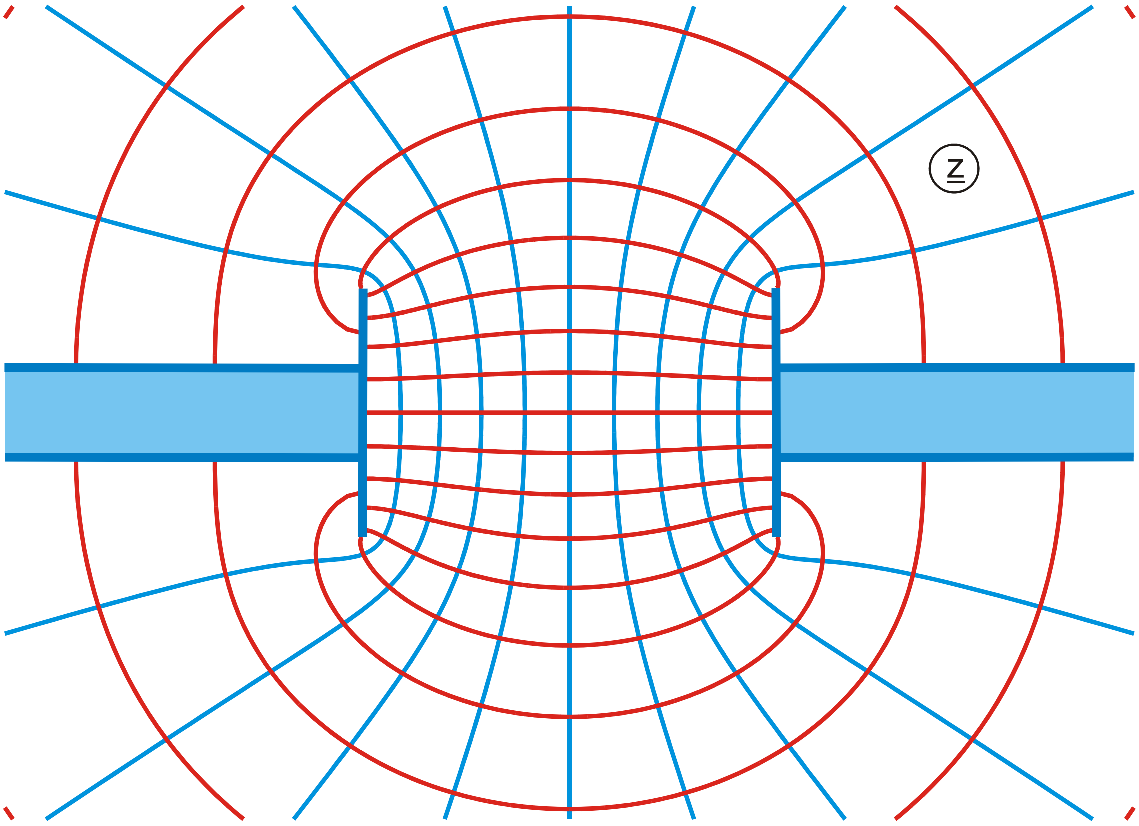
$v_C = \operatorname{arcosh}(1/k')$

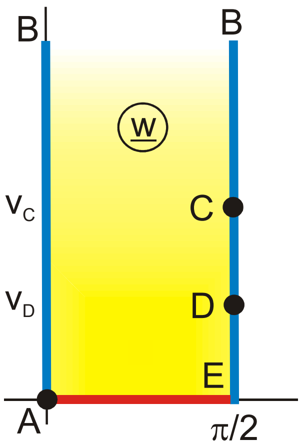
$v_D = \operatorname{ar\,cosh}\left(\sqrt{E/K}/k'\right)$

$d = \operatorname{Im} z(v_D)$

$0 \le u \le \pi/2$

$0 \le v \le 2{,}7$





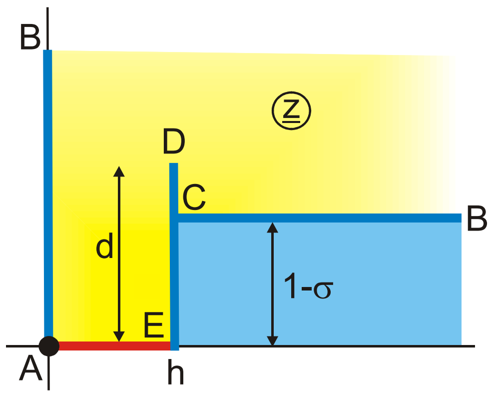


Abbildung C 3.3

$z = E_t(w,k')/(K\text{-}E) - \sigma\, F_t(w,k')/K$

$v_C = \operatorname{arcosh}(1/k')$

$$v_D = \operatorname{ar\,cosh}\left(\frac{1}{k'}\sqrt{1-\frac{\sigma(K-E)}{K}}\right)$$

$d = \operatorname{Im} z(\pi/2 + jv_D)$

$h = E'/(K\text{-}E) - \sigma K'/K$

$0 \le \sigma \le 1$

$0 \le u \le \pi/2$

$0 \le v \le 3$

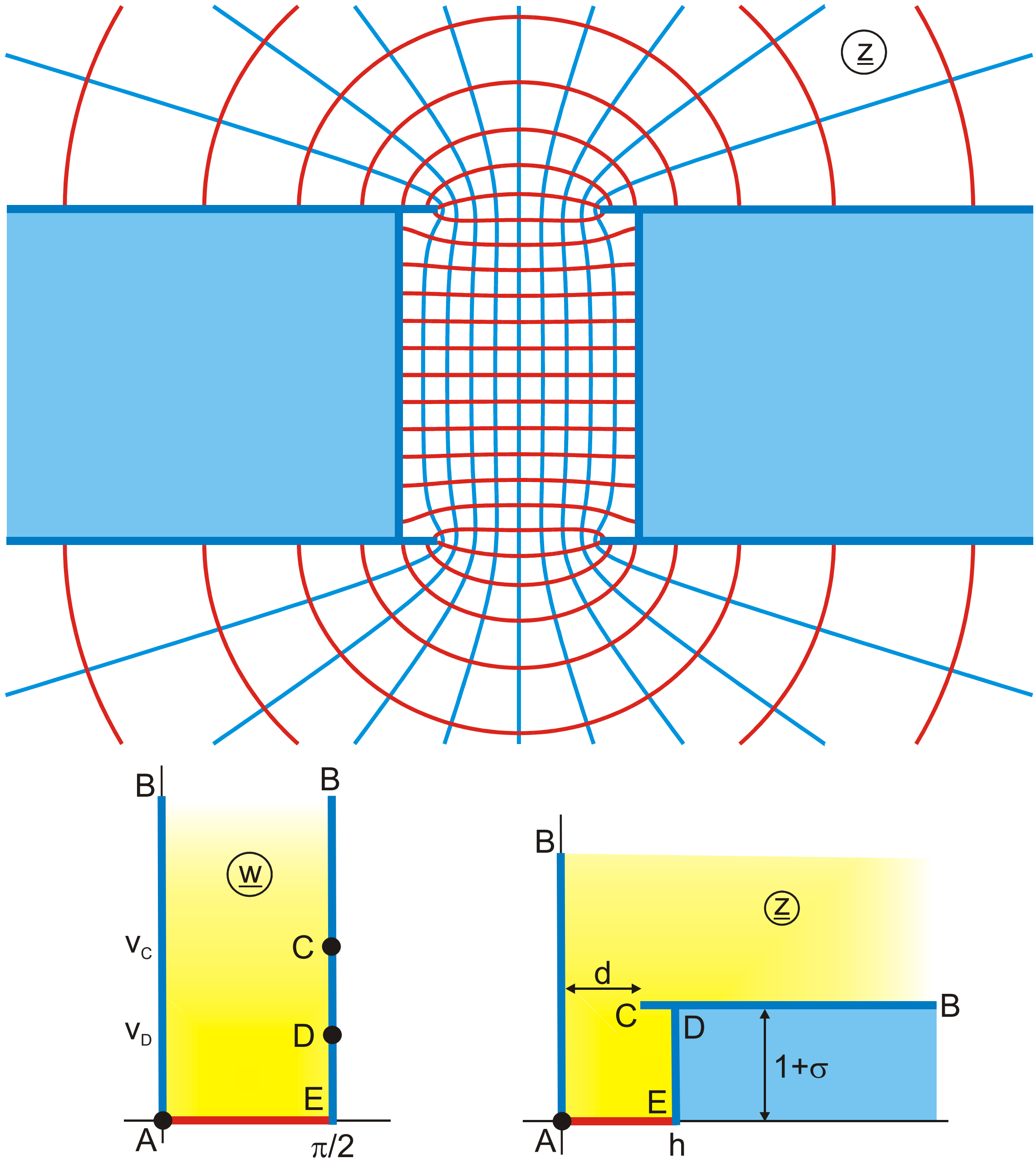


Abbildung C 3.4

$z = E_t(w,k')/(K-E) - \sigma\, F_t(w,k')/K$

$v_D = \operatorname{arcosh}(1/k')$

$$v_C = \operatorname{ar\,cosh}\left(\frac{1}{k'}\sqrt{1+\frac{\sigma(K-E)}{K}}\right)$$

$d = \operatorname{Re} z(\pi/2+jv_E)$

$h = E'/(K-E) - \sigma K'/K$

$\sigma \geq 0$

$0 \leq u \leq \pi/2$

$0 \leq v \leq 5$

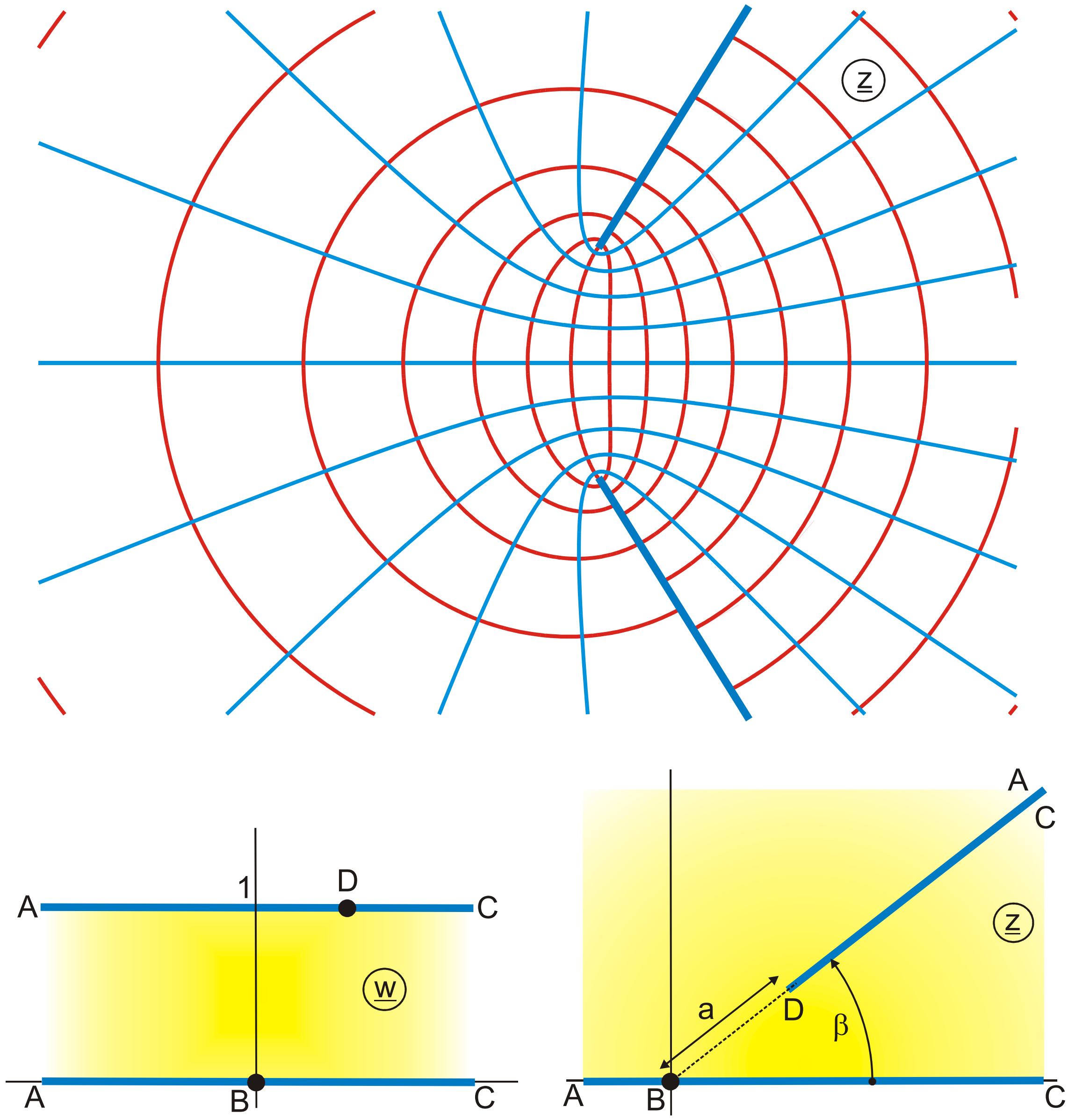


Abbildung C 4

$$z = \exp(\beta w) - \exp(\{\beta - \pi\} w)$$

$$a = \frac{\pi}{\beta}\left(\frac{\pi}{\beta} - 1\right)^{(\beta/\pi - 1)}$$

$$u_E = \frac{1}{\pi}\ln\left(\frac{\pi}{\beta} - 1\right)$$

$-1 \leq u \leq 4$

$0 \leq v \leq 1$

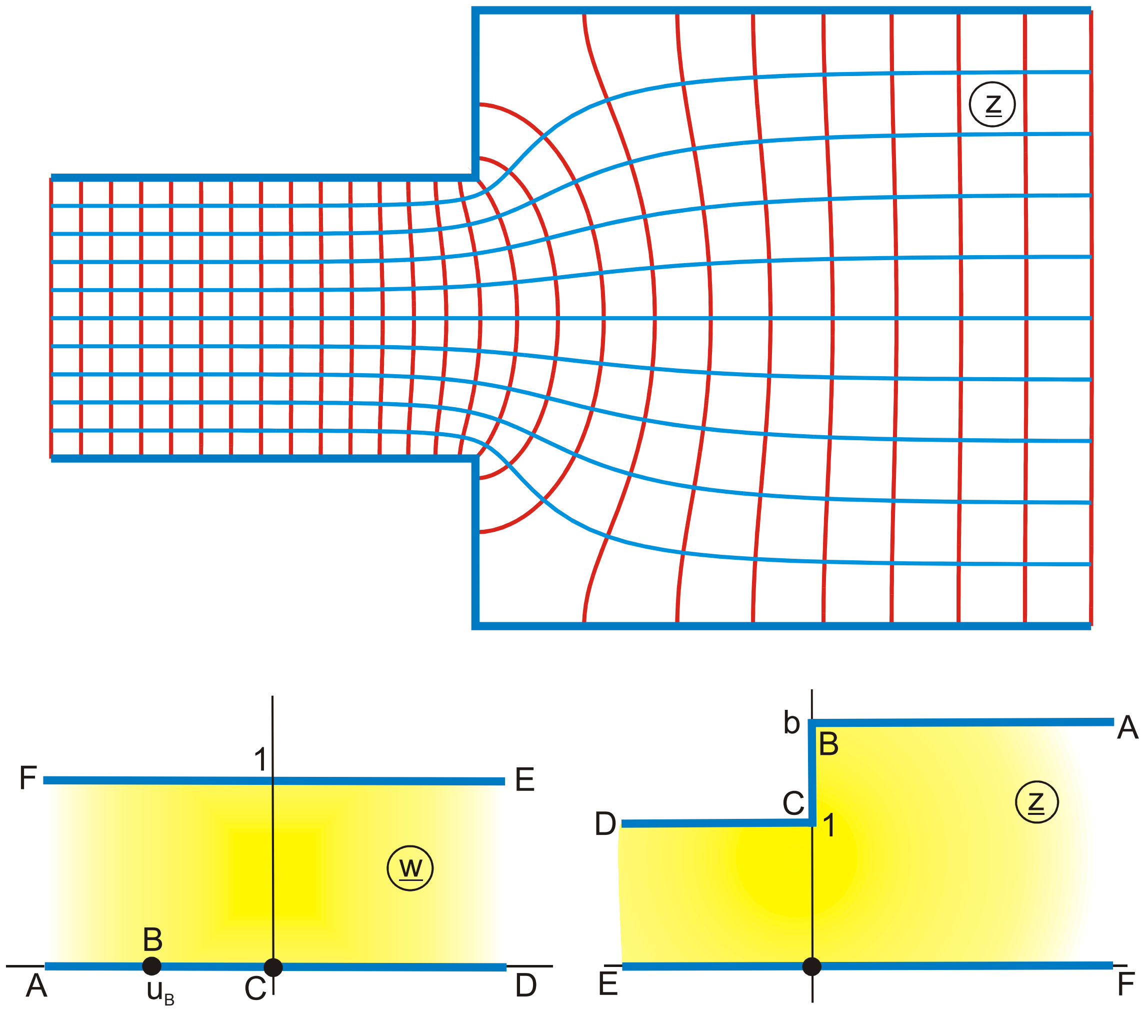


Abbildung C 5

$$z = \frac{2}{\pi}\left\{b\,\mathrm{ar\,tanh}\,w_1 - \mathrm{ar\,tanh}(bw_1)\right\} + j$$

$$w_1 = \sqrt{\frac{w_0 - 1}{b^2 w_0 - 1}} \qquad w_0 = \exp(w\pi)$$

$$u_B = -\frac{2}{\pi}\ln b$$

$-2 \leq u \leq 3$ $\qquad$ $0 \leq v \leq 1$

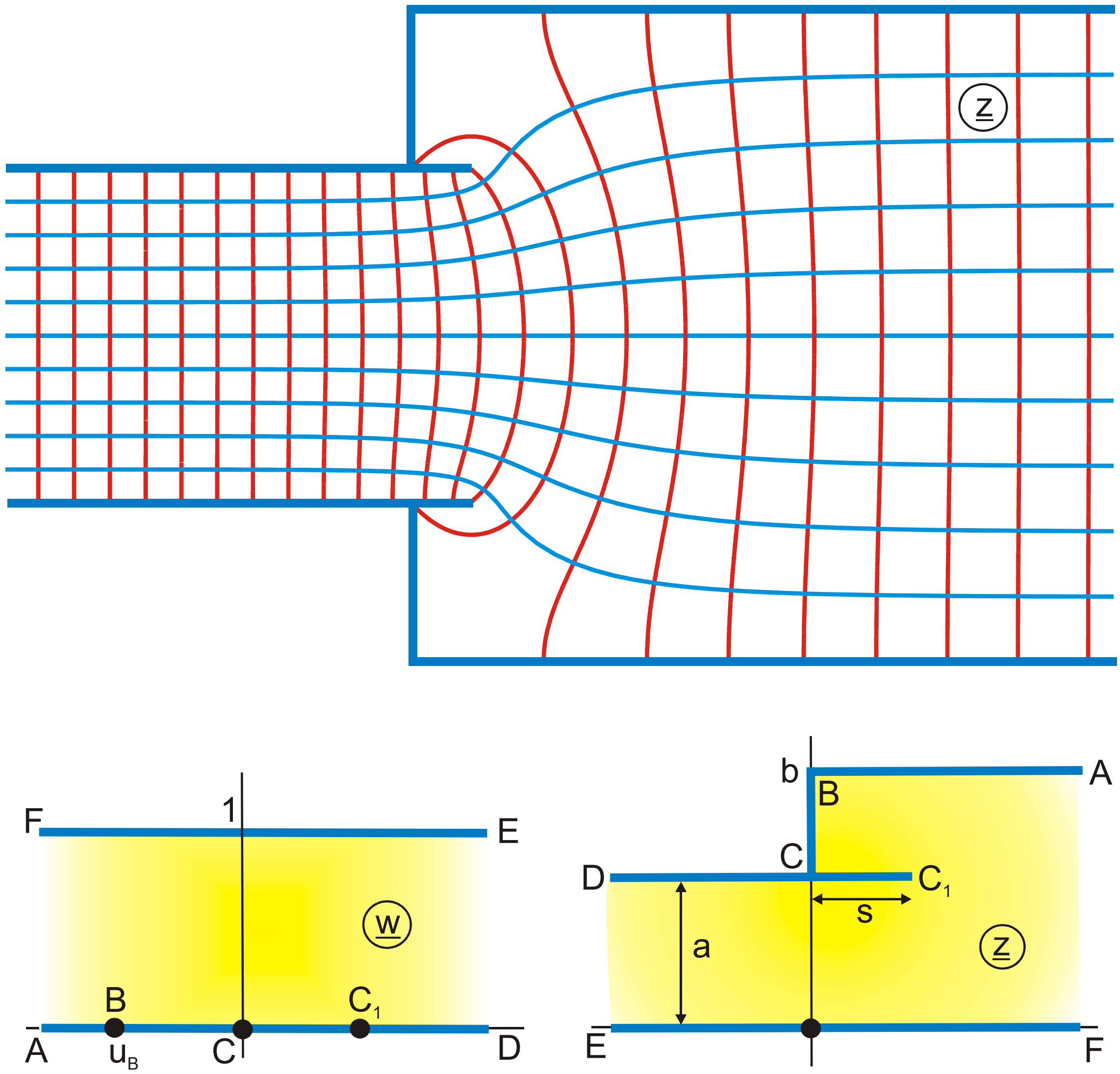


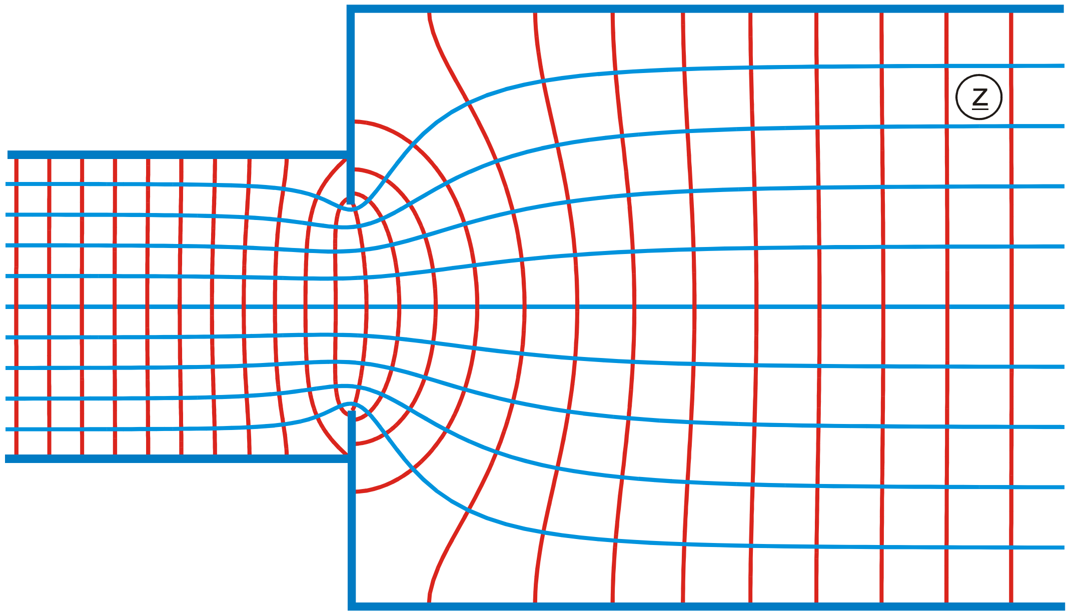
Abbildung C 5.1

$$z = \frac{2}{\pi}\{b\,\mathrm{ar\,tanh}\,w_1 - a\,\mathrm{ar\,tanh}(bw_1)\} + ja$$

$$w_1 = \sqrt{\frac{w_0 - 1}{b^2 w_0 - 1}}$$ $w_0 = \exp(w\pi)$

$$u_B = -\frac{2}{\pi}\ln b$$ $a < 1$

$-2 \le u \le 3$ $0 \le v \le 1$



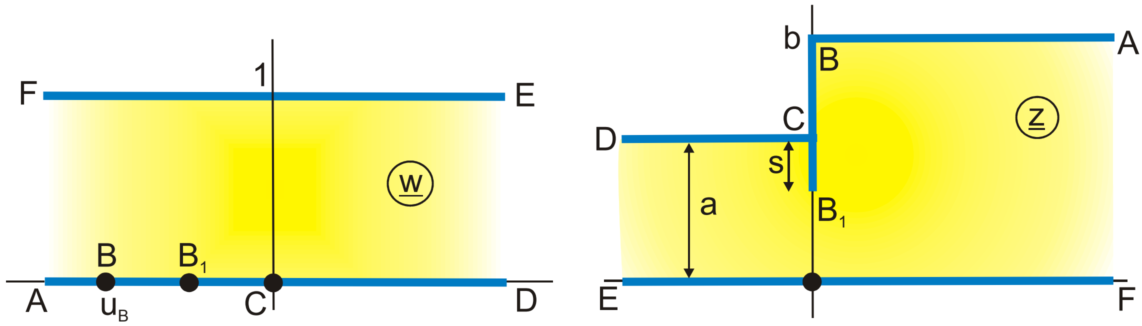


Abbildung C 5.2

$$z = \frac{2}{\pi}\{b \operatorname{ar\,tanh} w_1 - a \operatorname{ar\,tanh}(bw_1)\} + ja$$

$$w_1 = \sqrt{\frac{w_0 - 1}{b^2 w_0 - 1}}$$

$w_0 = \exp(w\pi)$

$$u_B = -\frac{2}{\pi}\ln b$$

$a > 1$

$b > 1 > a$

$-3 \le u \le 2$

$0 \le v \le 1$

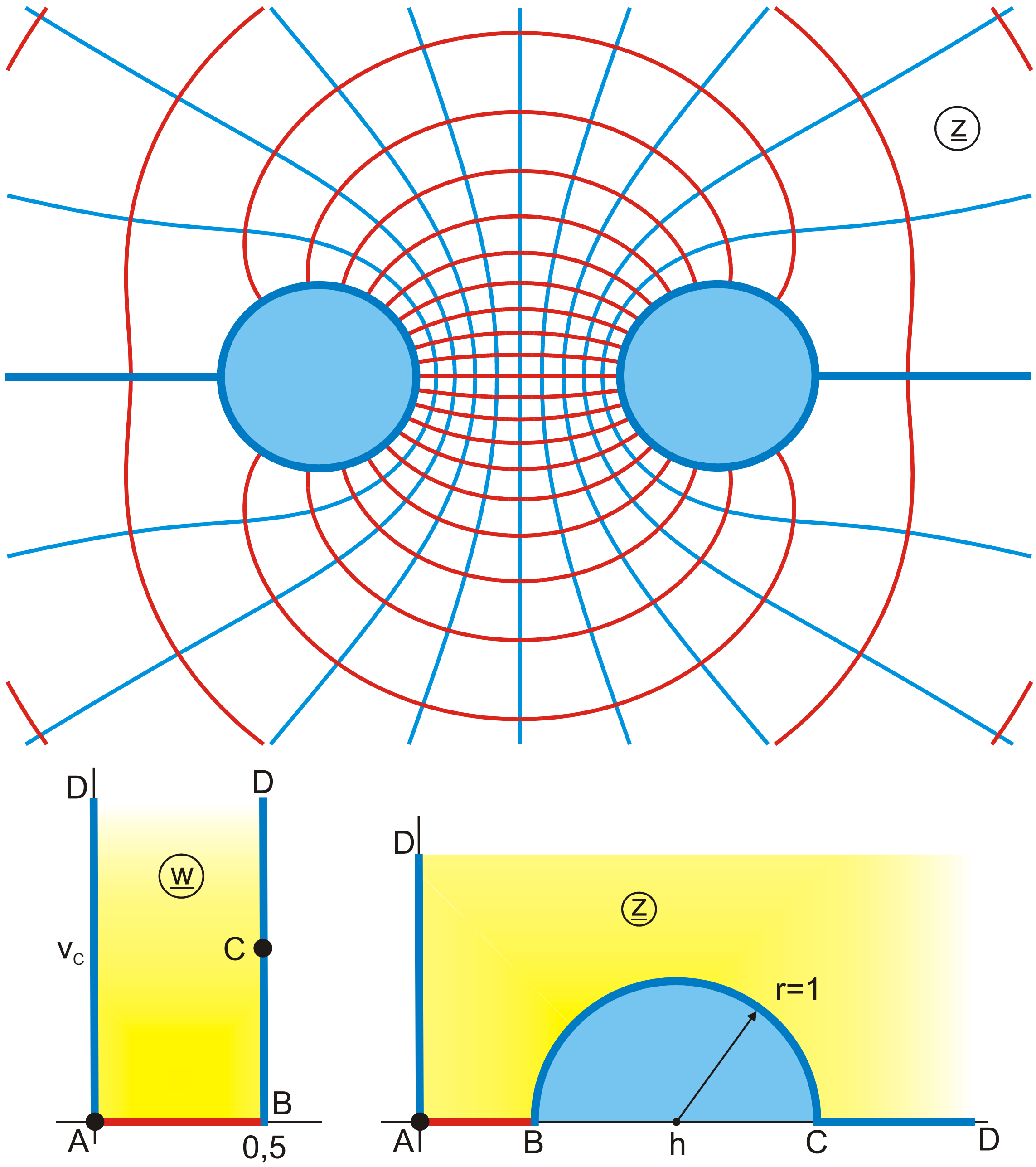


Abbildung C 6

$$z = \frac{\sigma - w_2}{\sigma w_2 - 1} + h$$

$w_2 = \exp\,(w_1\pi/K')/\sigma^2$

$w_1 = F_t(w\pi, k) + K - jK'$

$\sigma = h + \mathrm{sqr}(h^2\text{-}1)$

$h = (\sigma + 1/\sigma)/2$

$\tau = \pi / \ln\sigma$

$\sigma = \exp\,(\pi\, K / K')$

$$k = \left(\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right)^2$$

$h = \cosh\,(\pi K/K')$

$0 \le u \le 0{,}5$

$0 \le v \le 1$

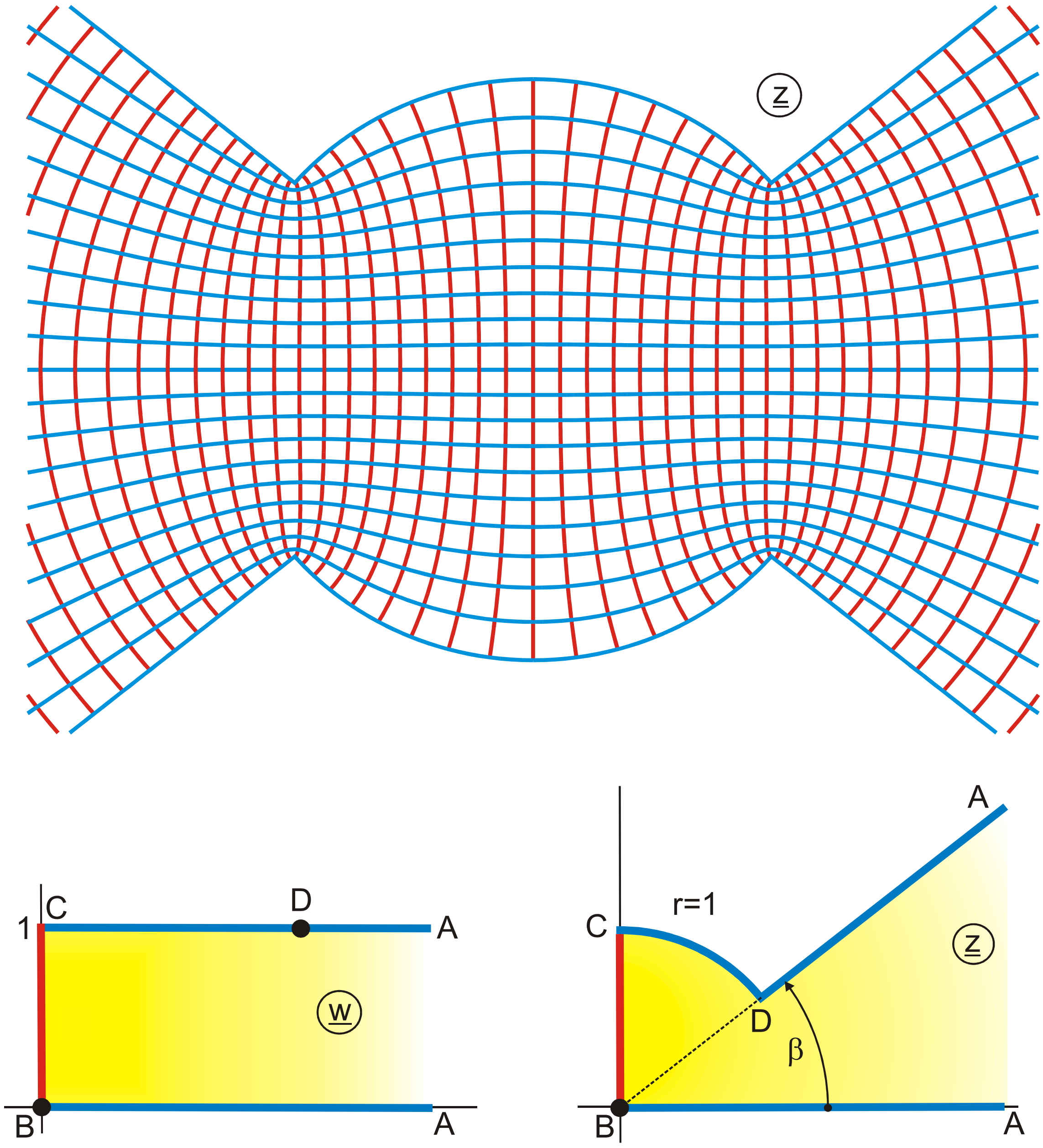


Abbildung C 7

$$z = j\exp\frac{w_2}{2}$$

$$w_2 = h\,\mathrm{ar\,cosh}\frac{w_1(1+h^2)-h^2}{w_1(1-h^2)} - \mathrm{ar\,cosh}\frac{2w_1-1-h^2}{1-h^2}$$

$$w_1 = 1-\left(\frac{1+w_0}{1-w_0}\right)^2 \qquad w_0 = \exp(w\pi)$$

$$h = \frac{2\beta}{\pi} \qquad u_D = \frac{2}{\pi}\mathrm{ar\,tanh}\sqrt{1-h^2}$$

$0 \le u \le 2{,}5$ $\qquad$ $0 \le v \le 1$

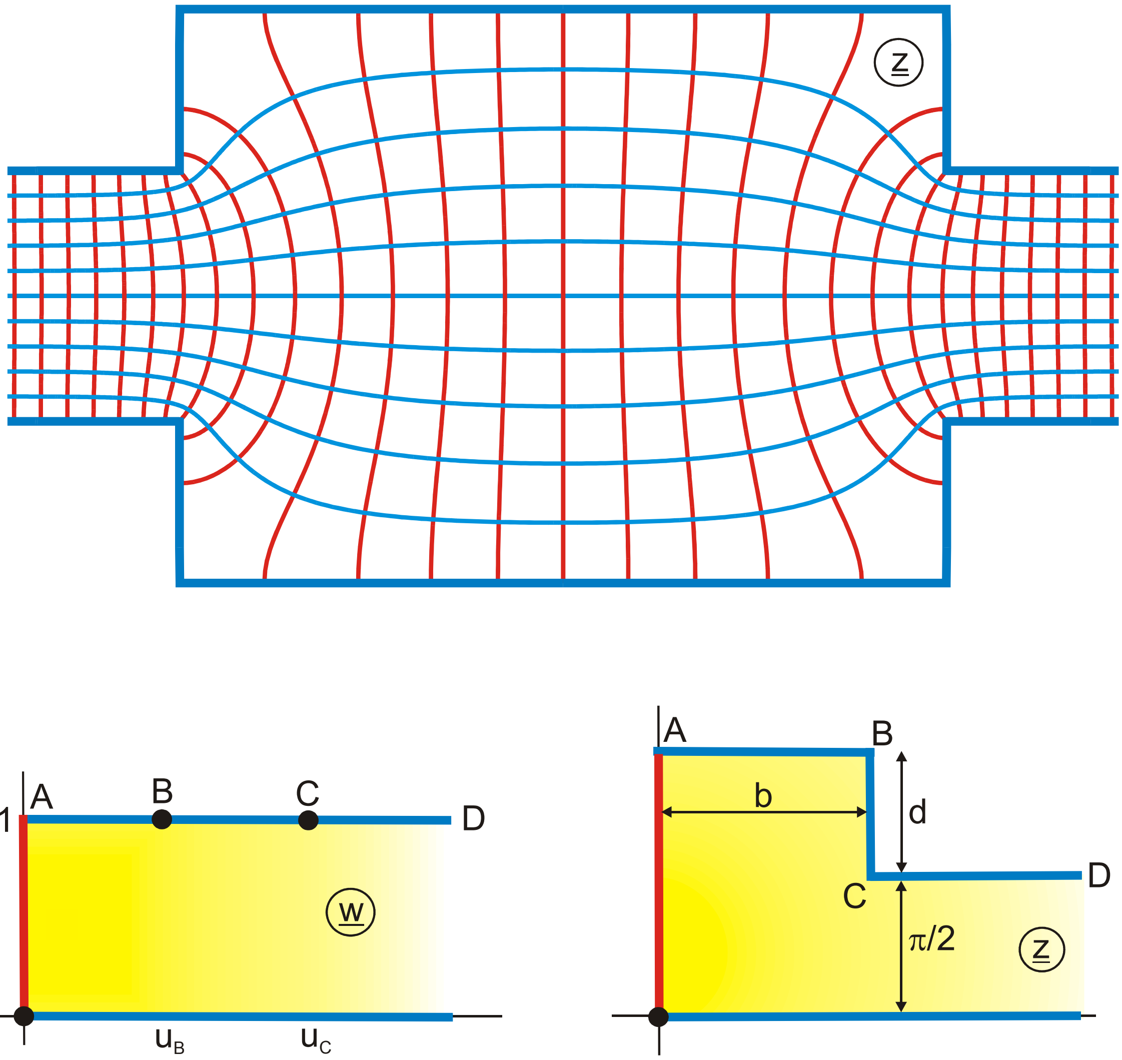


Abbildung C 8

$$z = \Pi_j(w_2, k, a) - s w_2 + j\left(\frac{\pi}{2} + d\right)$$

$$w_2 = F_a(w_1, k)$$

$$w_1 = \frac{1 + w_0}{1 - w_0} \Big/ k_1$$

$w_0 = \exp(w\pi)$

$a = F_a(k_1/k)$

$$u_C = \frac{2}{\pi} \operatorname{ar\,tanh} \frac{k_1}{k}$$

$$u_B = \frac{2}{\pi} \operatorname{ar\,tanh} k_1$$

$k_1 < k$

$b = K(k)\,[s - Z_e(a,k)]$

$$s = \frac{\operatorname{sn}(a,k)\,\operatorname{dn}(a,k)}{\operatorname{cn}(a,k)}$$

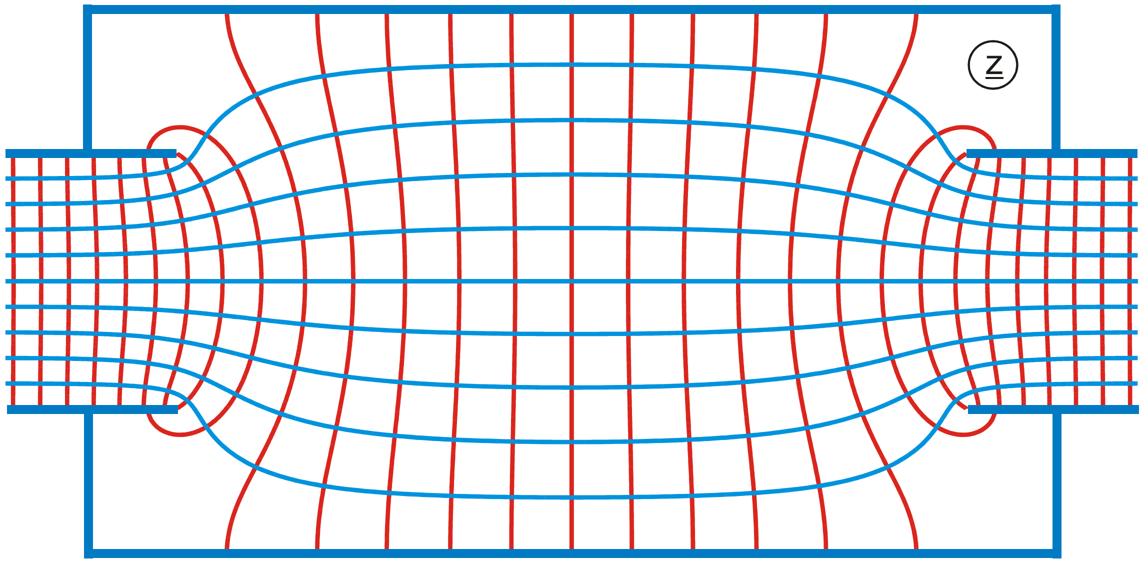
$$d = K'(k)\{s - Z_e(a,k)\} - \frac{\pi a}{2K(k)}$$

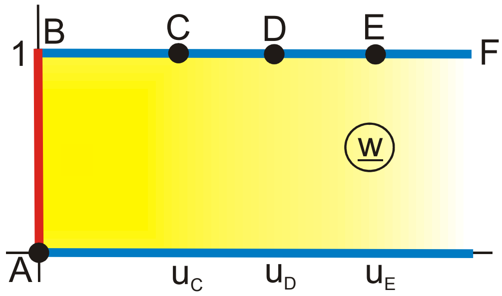
$0 \le u \le 3$

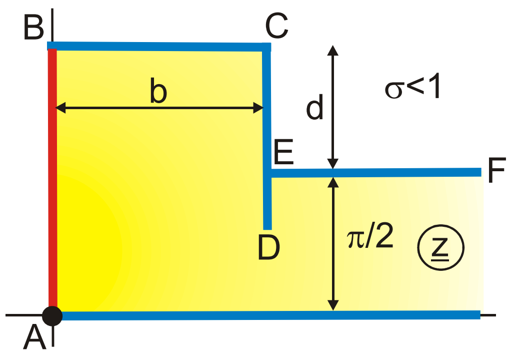
$0 \le v \le 1$

$k = 0{,}95$

$k_1 = 0{,}93$







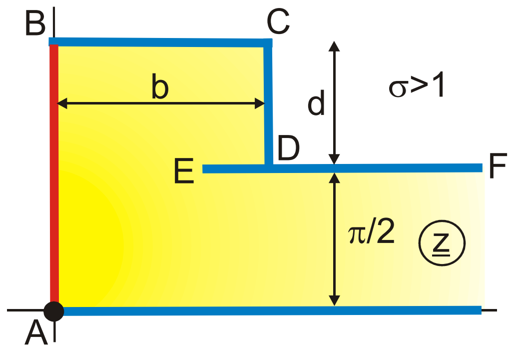


Abbildung C 8.1

$$z = \Pi_j(w_2, k, a) - s w_2 + j\left(\frac{\pi}{2} + d\right)$$

$$w_2 = F_a(w_1, k)$$

$$w_1 = \frac{1 + w_0}{1 - w_0} \Big/ k_1$$

$w_0 = \exp(w\pi)$

$$u_D = \frac{2}{\pi} \operatorname{ar\,tanh} \frac{k_1}{k} \quad \text{für} \quad \sigma > 1$$

$$u_E = \frac{2}{\pi} \operatorname{ar\,tanh} \frac{k_1}{k} \quad \text{für} \quad \sigma < 1$$

$k_1 < k$

$$s = \sigma \frac{\operatorname{sn}(a,k)\,\operatorname{dn}(a,k)}{\operatorname{cn}(a,k)}$$

$0 \le u \le 3$

$k = 0{,}99$

$a = F_a(k_1/k)$

$$u_C = \frac{2}{\pi} \operatorname{ar\,tanh} k_1$$

C 8 für σ=1

$b = K'(k)\,[s - Z_e(a,k)]$

$$d = K'(k)\{s - Z_e(a,k)\} - \frac{\pi a}{2K(k)}$$

$0 \le v \le 1$

$k_1 = k - 0{,}05$ σ=2

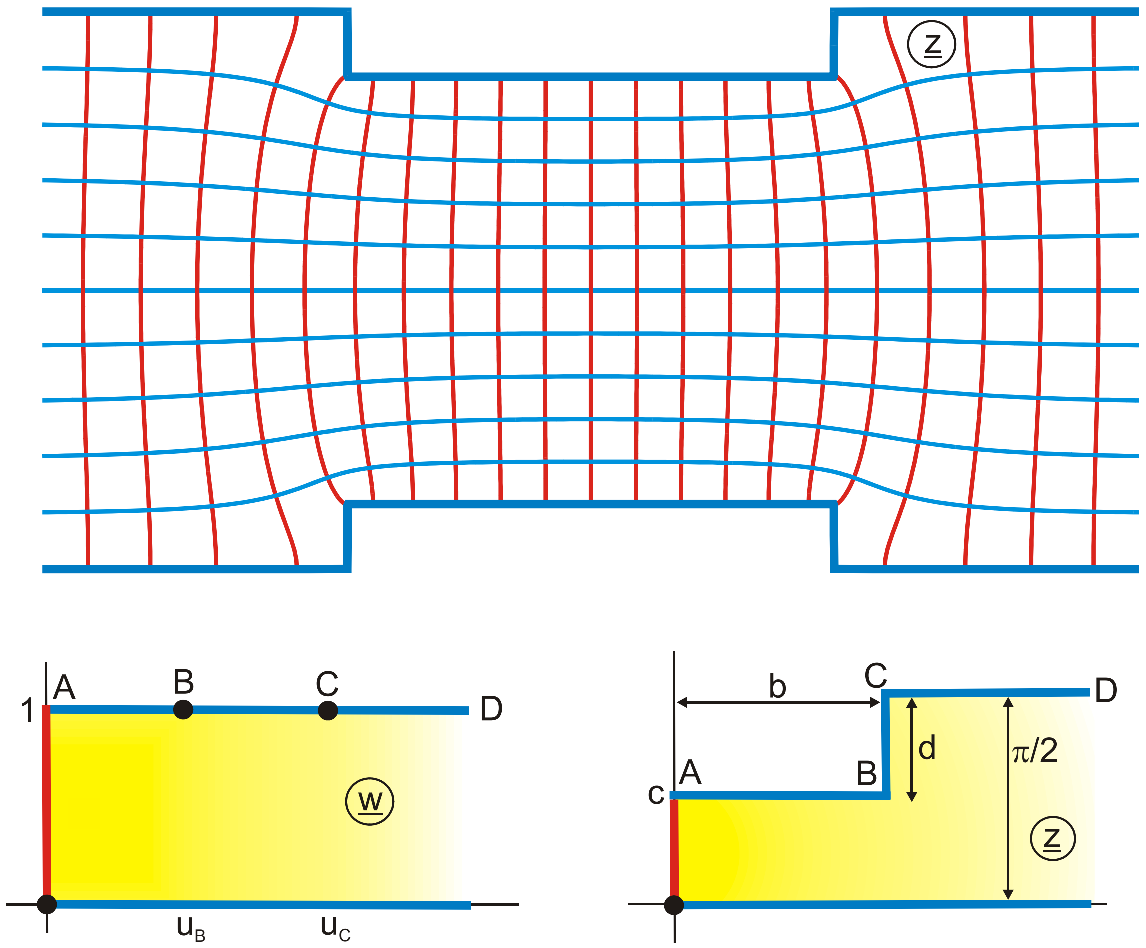


Abbildung C 9

$$z = \Pi_j(w_2, k, a) - k^2 \frac{\mathrm{sn}(a,k)\,\mathrm{cn}(a,k)}{\mathrm{dn}(a,k)} w_2 + jc$$

$$w_2 = F_a(w_1, k) \qquad w_1 = \frac{1+w_0}{1-w_0}\Big/ k_1 = \frac{-1}{k_1 \tanh(w\pi/2)}$$

$$w_0 = \exp(w\pi) \qquad a = F_a(k_1/k)$$

$$u_C = \frac{2}{\pi} \mathrm{ar\,tanh} \frac{k_1}{k} \qquad u_B = \frac{2}{\pi} \mathrm{ar\,tanh}\, k_1$$

$$k_1 < k \qquad b = K'(k)\,[s - Z_e(a,k)]$$

$$b = K(k) \left\{ k^2 \frac{\mathrm{sn}(,k)\,\mathrm{cn}(a,k)}{\mathrm{dn}(a,k)} - Z_e(a,k) \right\} \qquad d = \frac{\pi}{2} - c$$

$$d = -K'(k) \left\{ k^2 \frac{\mathrm{sn}(,k)\,\mathrm{cn}(a,k)}{\mathrm{dn}(a,k)} - Z_e(a,k) \right\} + \frac{\pi a}{2K(k)}$$

$0 \le u \le 2$ $\qquad$ $0 \le v \le 1$

$k = 0{,}98$ $\qquad$ $k_1 = k - 0{,}028$

Abbildungen Gruppe D

Zwei unendlich ausgedehnte Elektroden, entgegengesetzt gleich große Ladung

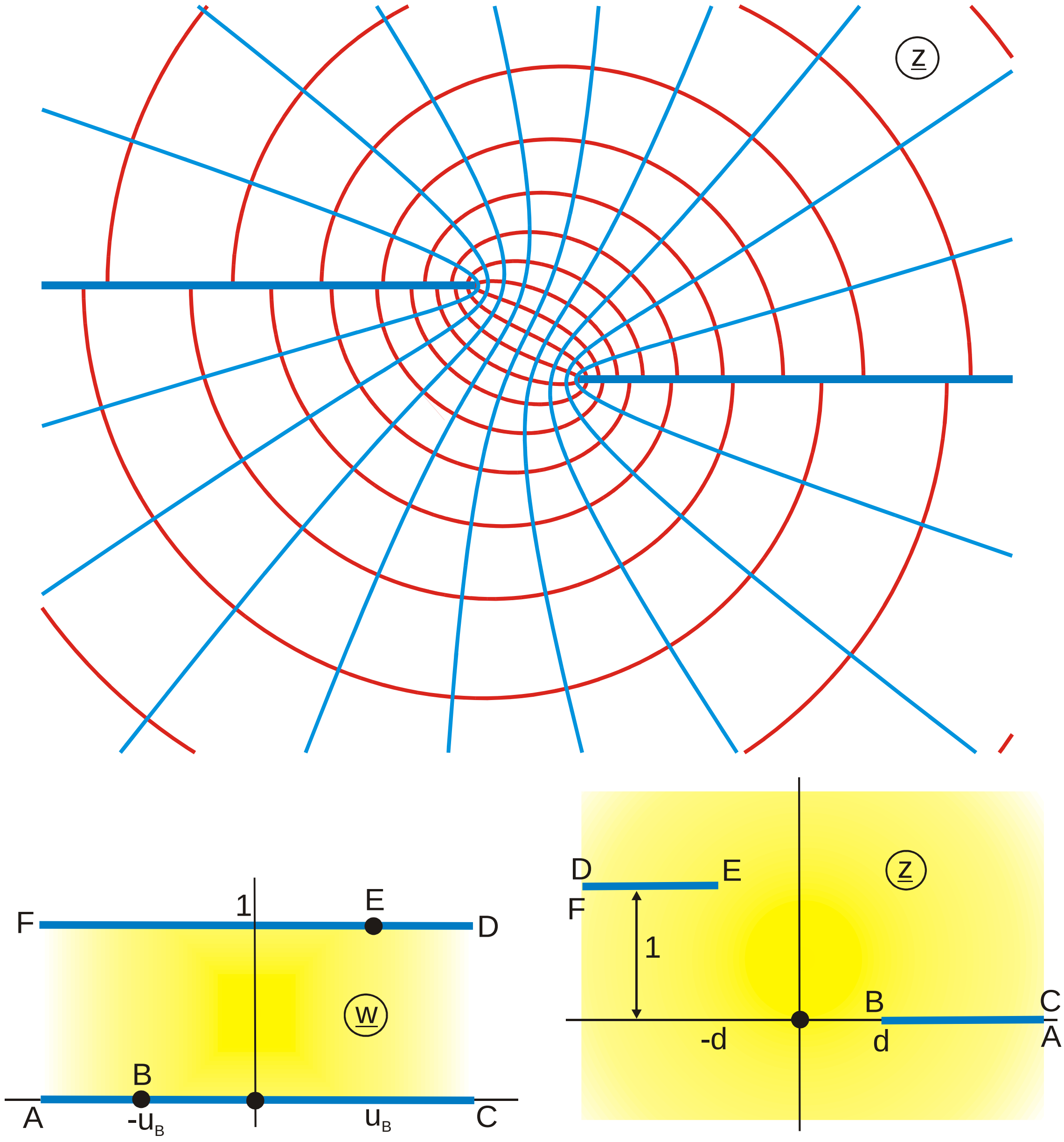


Abbildung D 1

$$z = \frac{1}{a\pi}\cosh(w\pi) + w$$

$$u_B = \frac{1}{\pi}\operatorname{ar\,sinh} a \qquad d = \sqrt{1+a^2}/(a\pi) - u_B$$

$-1 \le u \le 1$ $\qquad 0 \le v \le 1$

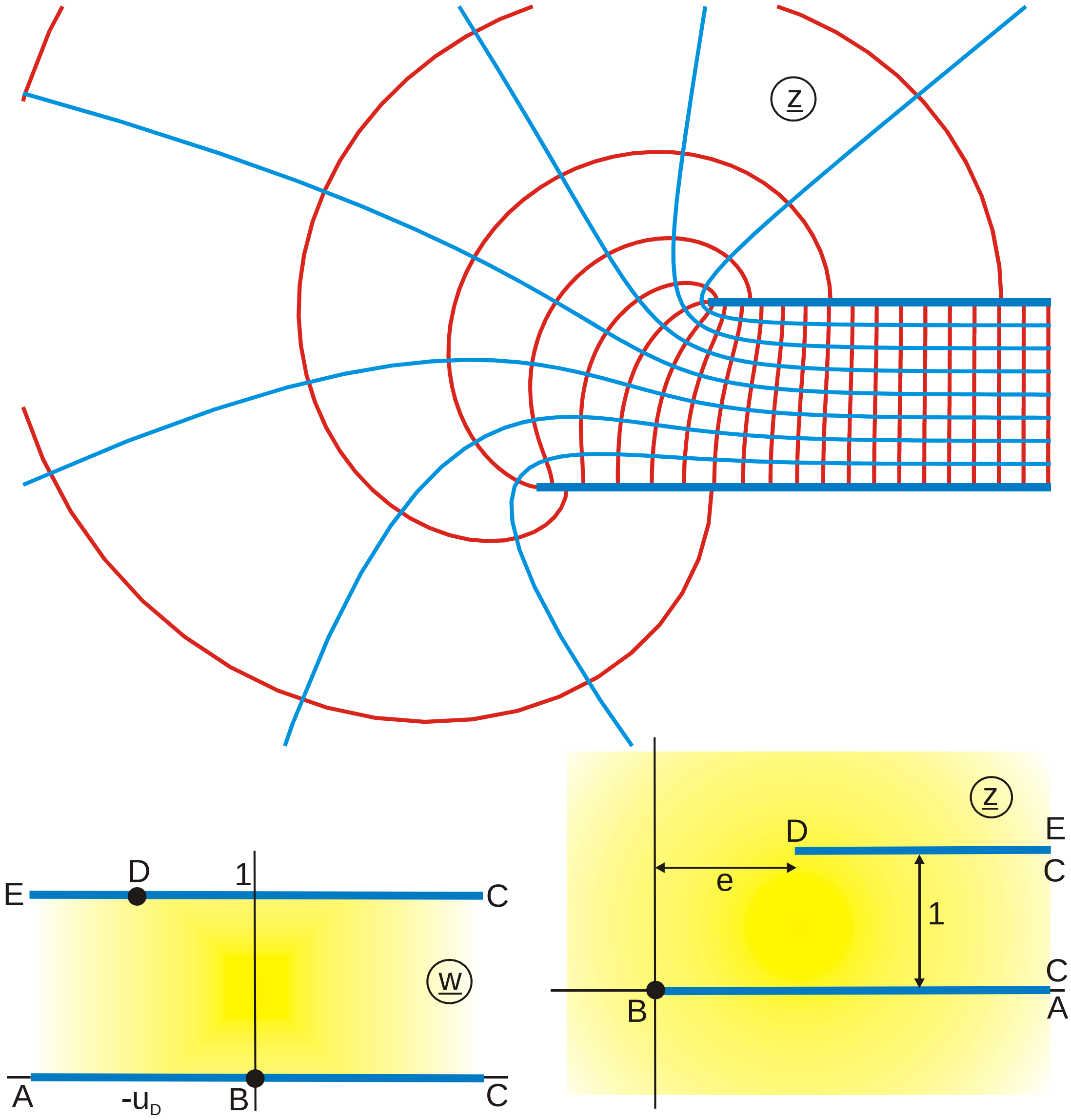


Abbildung D 1.1 (Maxwell Kurven für e = 0)

$$z = \frac{1}{a\pi}\left[\frac{w_1^{\,2}}{2} + (1-a)w_1\right] - w - d + j$$

$w_1 = \exp(w\pi)$

$0 < a \leq 1$ $\qquad$ $e = 0$ für $a = 1$

$$d = \frac{1}{\pi}\left(1 - \frac{1}{2a}\right) \qquad e = \frac{1}{2\pi}\left(\frac{1}{a} - a - 2\ln a\right)$$

$$u_D = \frac{1}{\pi}\ln a$$

$-3{,}5 \leq u \leq 0{,}5$ $\qquad$ $0 \leq v \leq 1$

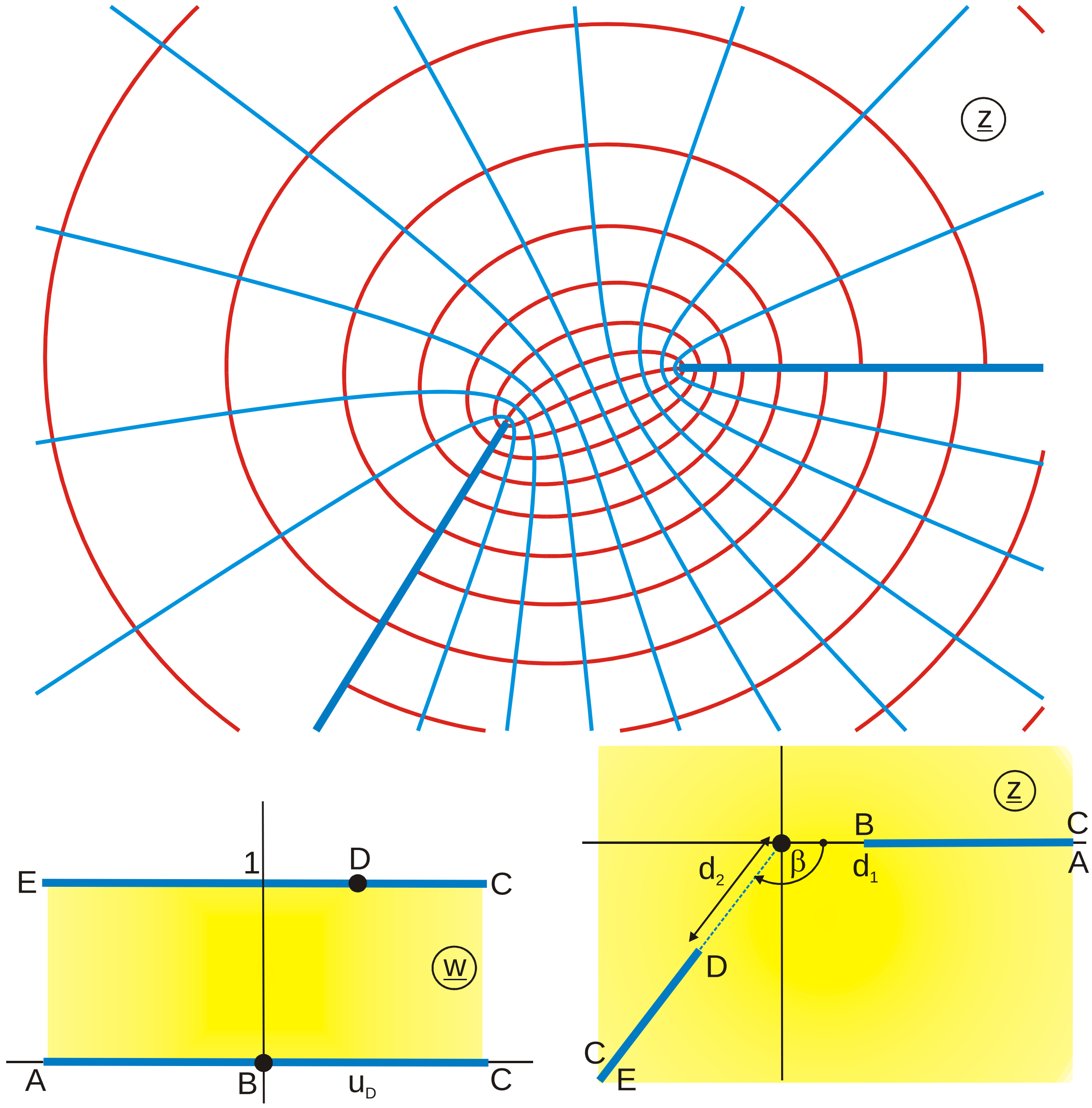


Abbildung D 1.2

$$z = \frac{\left(\frac{a}{b} - \frac{1-a}{1-b} w_1 + \frac{1}{2-b} w_1^{\,2}\right)}{w_1^{\,b}}$$

$w_1 = \exp(w\pi)$

$b = \beta/\pi$

$$d_1 = \frac{1}{2-b} + \frac{a-b}{b(1-b)}$$

$$d_2 = \frac{\left(\frac{a}{b} - \frac{a^2}{2-b}\right)}{a^b(1-b)}$$

$$u_D = \frac{1}{\pi}\ln a$$

$-1 \le u \le 0{,}8$

$0 \le v \le 1$

$a = 1{,}3$

$\beta = 120°$

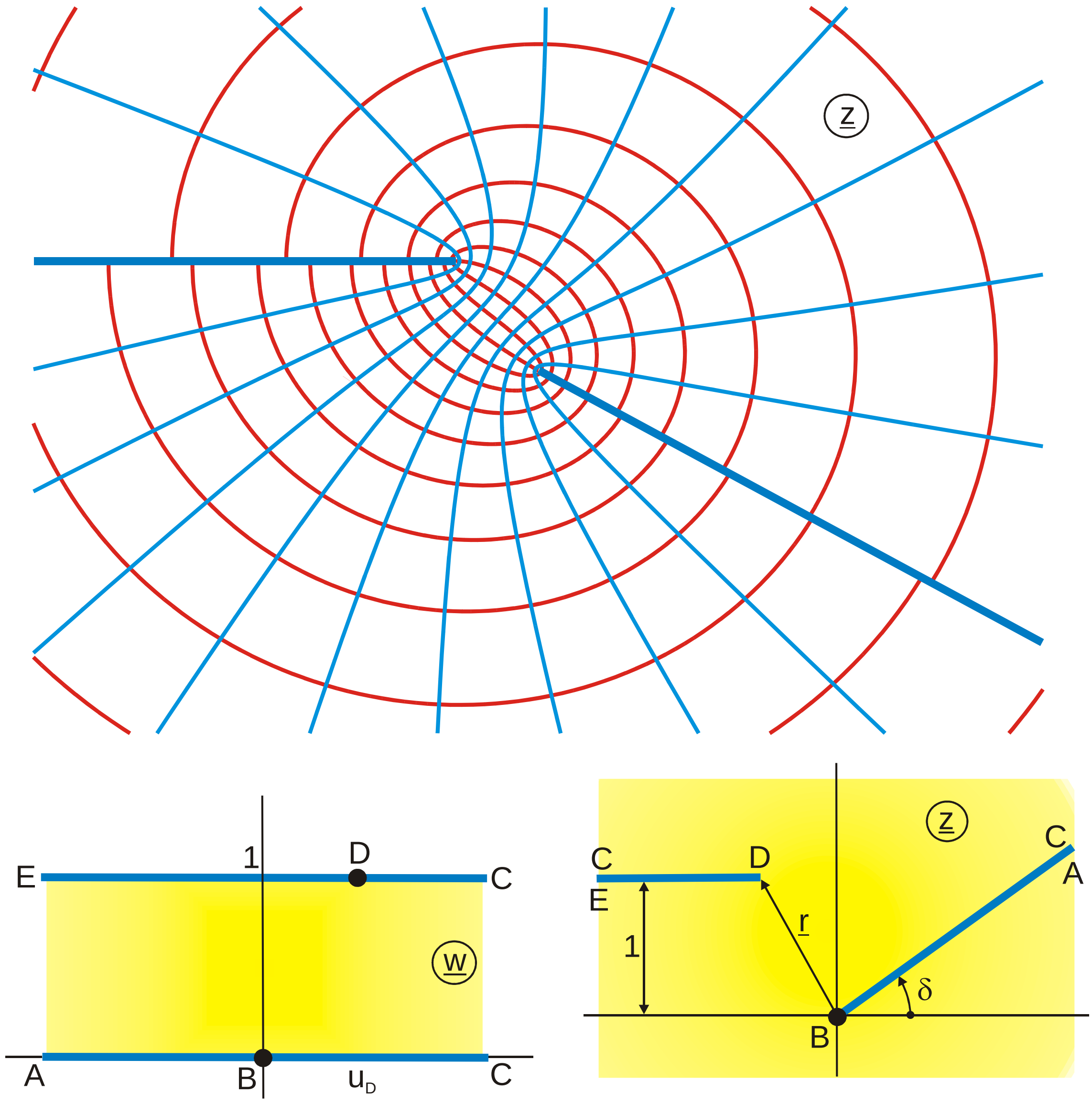


Abbildung D 1.3

$$z = A\left\{\frac{1}{w_1^{1+t}}\frac{w_1^{2}t(1+t)+w_1(1+a)(1-t^2)-at(1-t)}{1+t+a(1-t)}-1\right\}$$

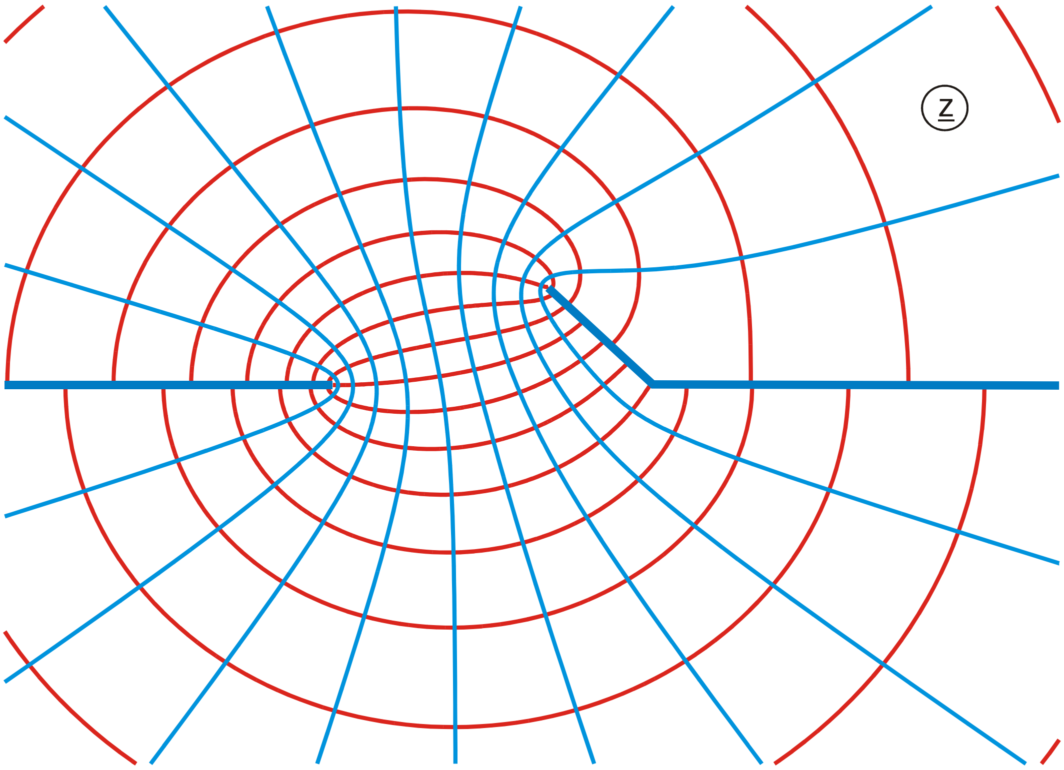
$w_1 = \exp(w\pi)$ $\qquad$ $t = \delta/\pi$

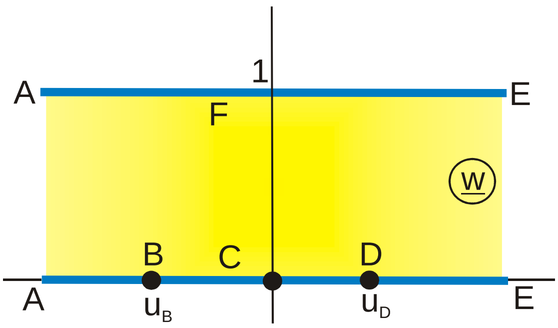
$$\underline{r} = A\left\{\frac{1}{a^t}+\frac{1-t+a(1+t)}{1+t+a(1-t)}-1\right\} = r\,e^{j\varphi} \qquad A = \frac{\exp\left(j\pi[1+t]\right)}{\sin(\pi t)}$$

$$u_D = \frac{1}{\pi}\ln\left(-a\right) \qquad a < 0$$

$-1 \leq u \leq 1{,}5$ $\qquad$ $0 \leq v \leq 1$

$a = -2$ $\qquad$ $\delta = -30°$





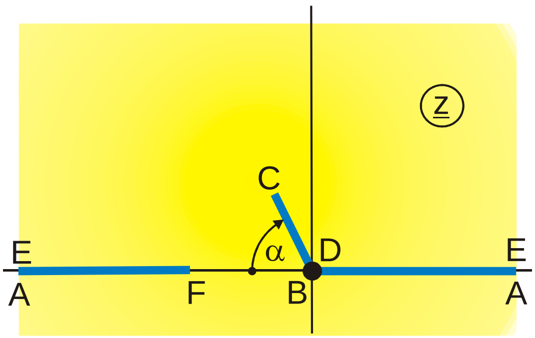


Abbildung D 1.4

$$z = \frac{(w_1 - a)^{1-\alpha/\pi}(w_1 - b)^{1+\alpha/\pi}}{w_1}$$

$w_1 = \exp(w\pi)$

gegeben: a, b, α

a > 1

$$u_D = \frac{1}{\pi}\ln a$$

0 < b < 1

$$u_B = \frac{1}{\pi}\ln b$$

$-1 \leq u \leq 1$

$0 \leq v \leq 1$

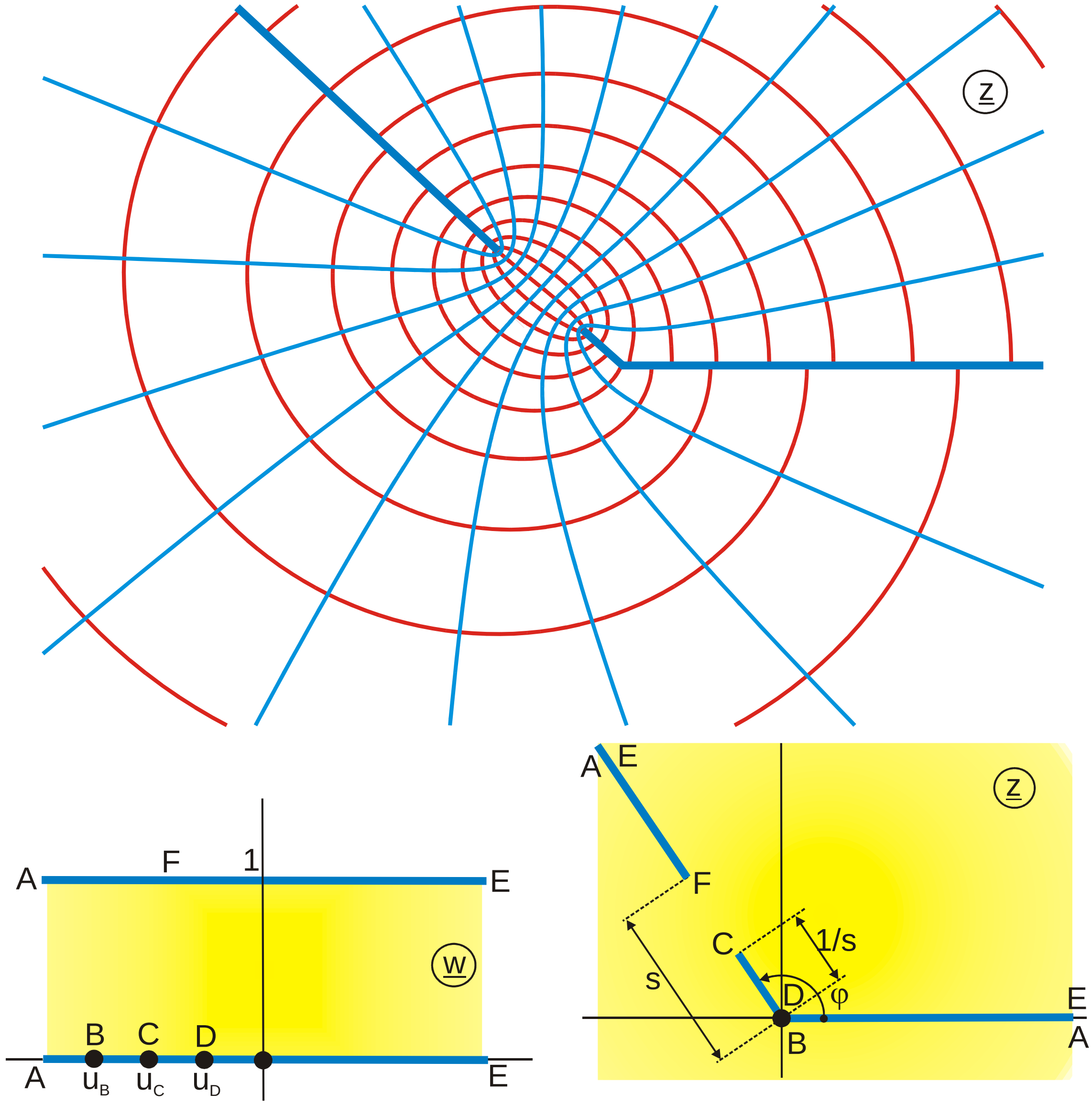


Abbildung D 1.5

$$z = \left(\frac{w_2 + a}{w_2 - a}\right)^{2f} \left(\frac{w_2 + 1/a}{w_2 - 1/a}\right)^{2f \cdot b}$$

$$w_2 = \frac{w_1/a - a}{w_1 - 1}$$

f = 1/(1+b)

b = φ/(2π-φ)

gegeben: φ, a

$w_1 = \exp(w\pi)$

$$s = \exp\left[4f\left\{\operatorname{ar\,tanh}(a/p) + b\,\operatorname{ar\,tanh}(ap)\right\}\right]$$

$$p = \sqrt{\frac{1 + a^2 b}{a^2 + b}}$$

$$u_B = \frac{1}{\pi}\ln\left(\frac{2}{1 + 1/a^2}\right)$$

$$u_C = \frac{1}{\pi}\ln\frac{p + a}{p + 1/a}$$

$$u_D = \frac{1}{\pi}\ln\frac{a^2 + 1}{2}$$

$-1{,}5 \le u \le 0{,}5$

$0 \le v \le 1$

a = 0,15

φ = 135°

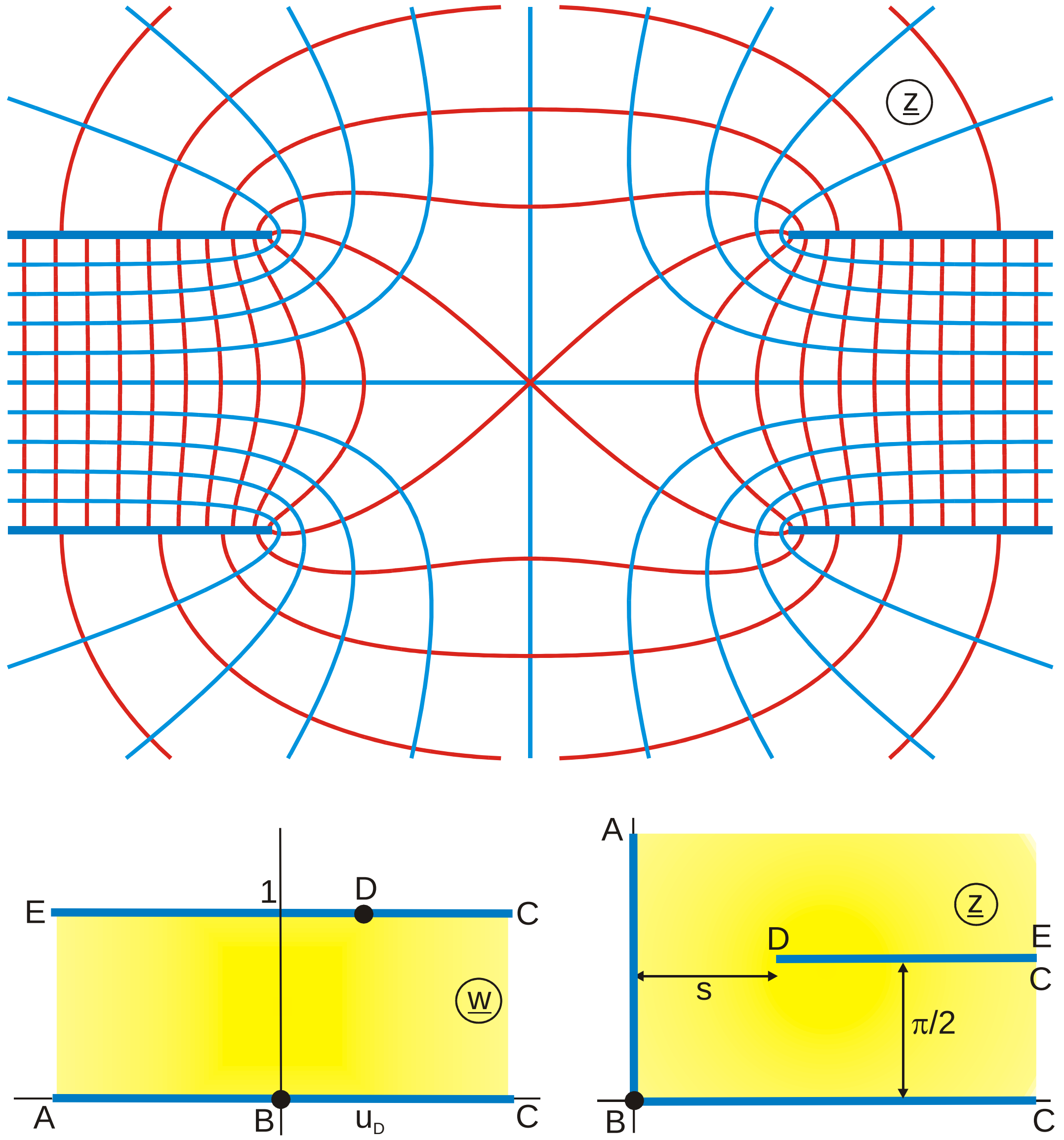


Abbildung D 2

$$z = \ln\left(\sqrt{w_1} + \sqrt{w_1 - 1}\right) + \sigma\sqrt{(w_1 - 1)/w_1}$$

$w_1 = \exp(w\pi)$

$\sigma > 0$

$u_D = \dfrac{1}{\pi}\ln\sigma$ $\qquad s = ar\sinh\sqrt{\sigma} + \sqrt{\sigma(1+\sigma)}$

$-1 \le u \le 3$ $\qquad 0 \le v \le 1$

$\sigma = 1{,}2$

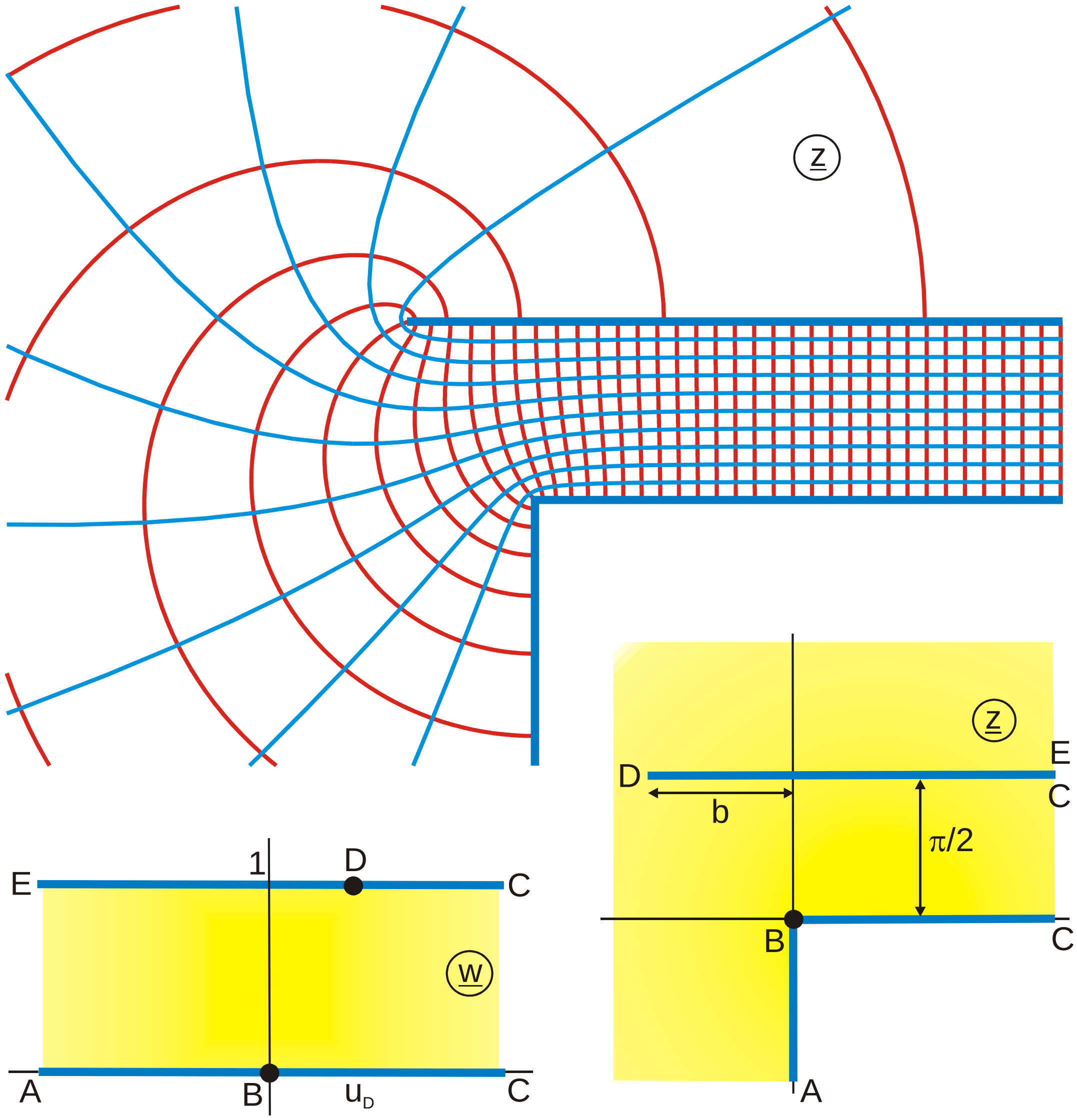


Abbildung D 2.1

$$z = \ln\left(\sqrt{w_1} + \sqrt{w_1 - 1}\right) - \left[\frac{\lambda}{3}\left(1 - 1/w_1\right) + 1\right]\sqrt{1 - 1/w_1}$$

$w_1 = \exp(w\pi)$

$\lambda < 0$

$$u_D = \frac{1}{\pi}\ln(-\lambda)$$

$$b = ar\sinh\sqrt{-\lambda} - \frac{1}{3}(2 + \lambda)\sqrt{1 - 1/\lambda}$$

$-1{,}5 \leq u \leq 3{,}5$

$0 \leq v \leq 1$

$\lambda = -0{,}2$

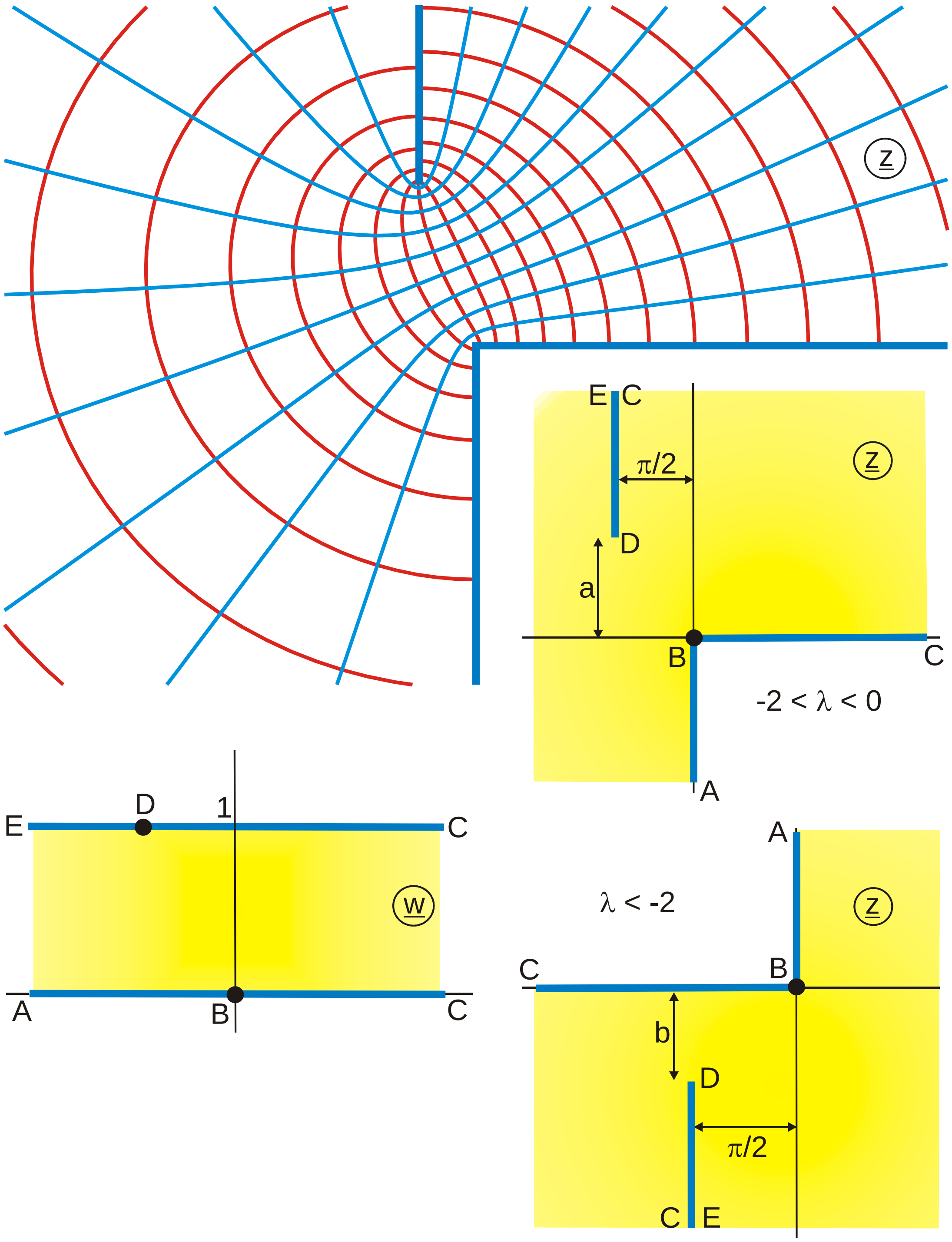


Abbildung D 2.2

$$z = \frac{\lambda + 2w_0}{(\lambda+2)w_0} w_1 - \arctan w_1$$

$w_1 = \sqrt{w_0 - 1}$ $\qquad$ $w_0 = \exp(w\pi)$

$\lambda < 0$

$-1{,}5 \leq u \leq 1{,}5$ $\qquad$ $0 \leq v \leq 1$

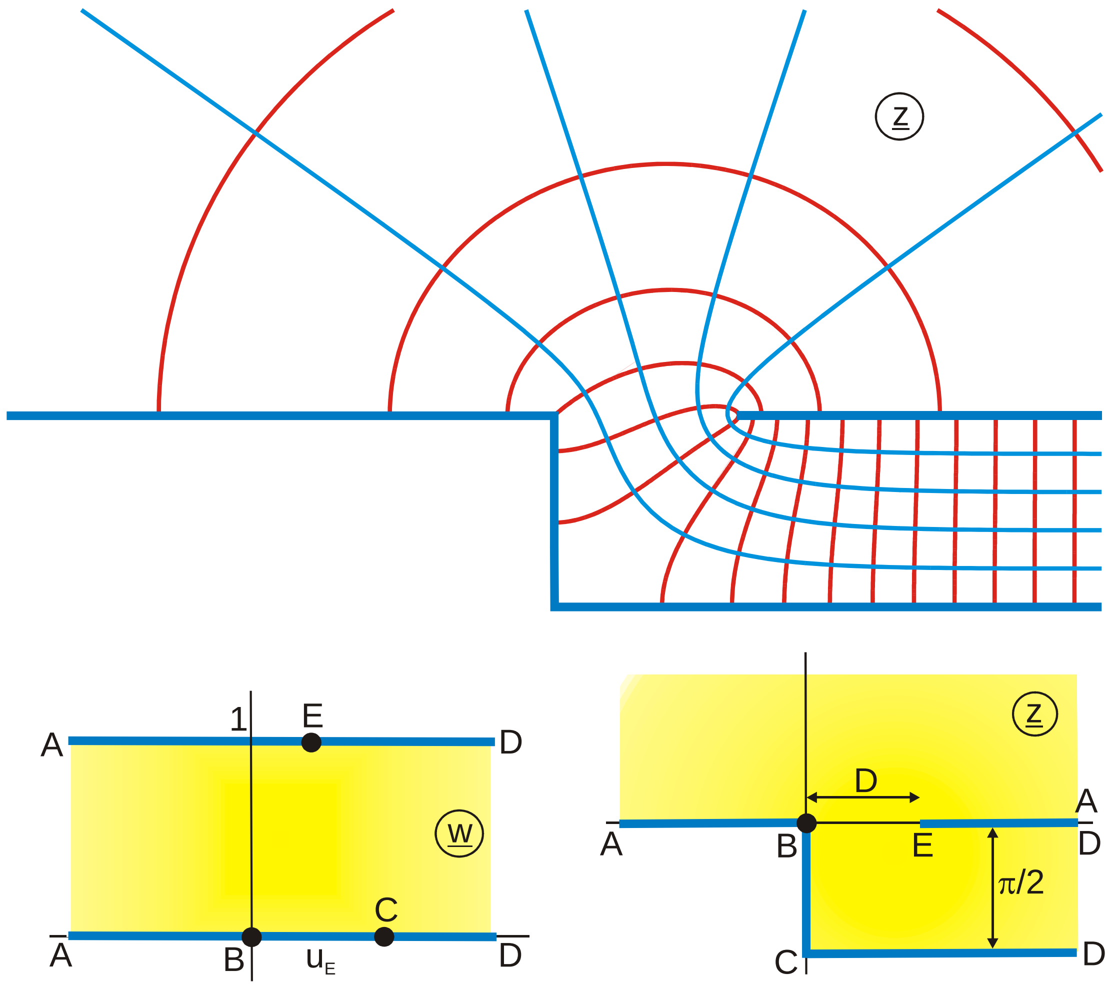


Abbildung D 2.3

$$z = \frac{w_1 w_2}{(a-1)w_0} + \operatorname{artanh}\frac{w_1}{w_2}$$

$$w_1 = \sqrt{w_0 - 1} \qquad w_2 = \sqrt{w_0 - a}$$

$$w_0 = \exp(w\pi)$$

$$d = ar\tanh\sqrt{\frac{p+1}{p+a}} + \frac{\sqrt{(p+1)(p+a)}}{p(a-1)}$$

$$p = \frac{2a}{a-1} \qquad u_E = \frac{1}{\pi}\ln p$$

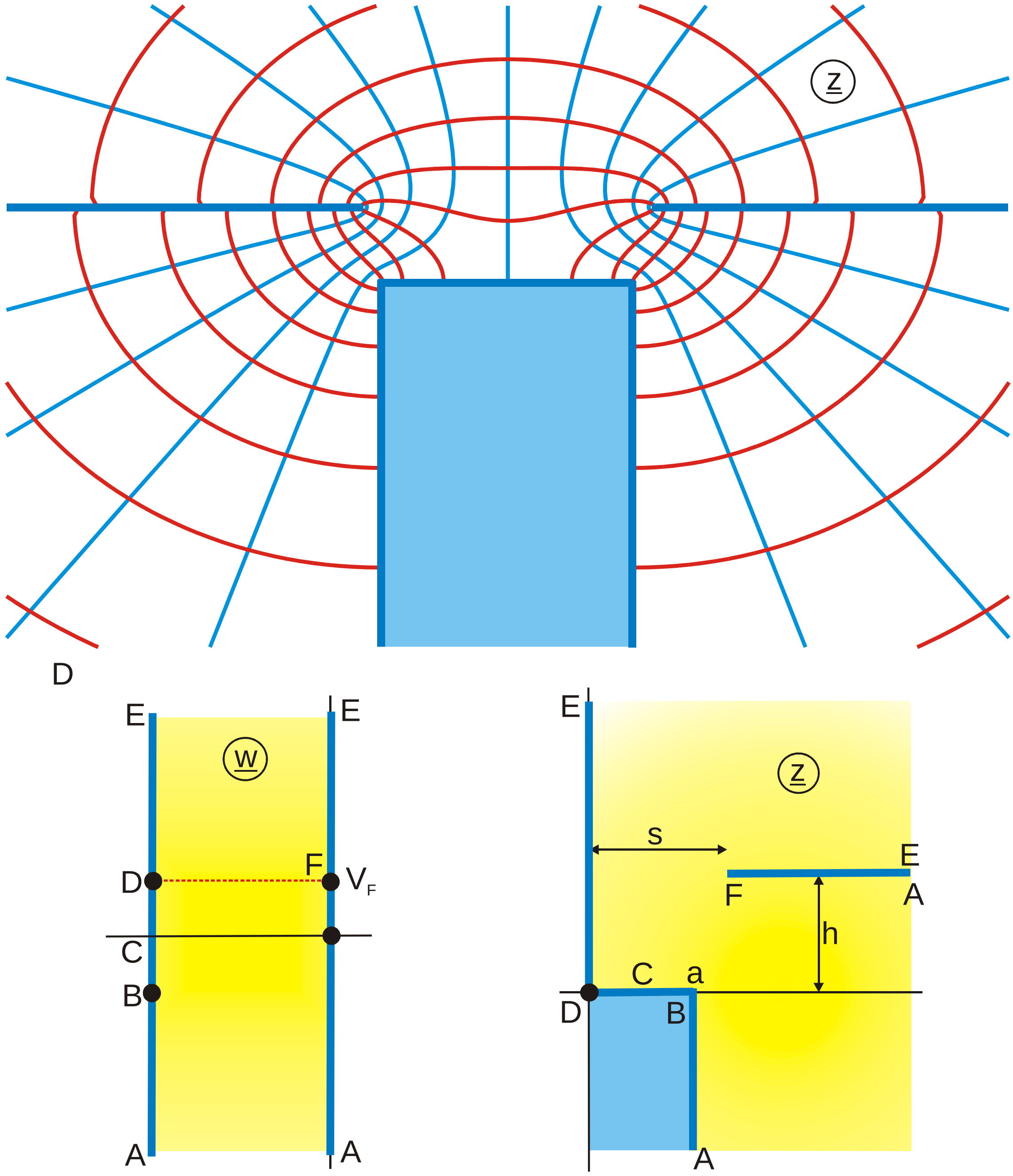


Abbildung D 2.4

$$z = K'(k) + jK(k) + jw_1 + \mathrm{sn}(w_1, k')$$

$$w_1 = F_t(w, k)$$

$$s = b + \sqrt{1 + 1/k'^2}$$

h = K(k)

a = 2K'(k)

$$b = \mathrm{Re}\, F_a\left(\sqrt{1 + 1/k'^2}, k'\right)$$

$v_D = -v_B = v_F = \mathrm{arcosh}(1/k)$

$-\pi/2 \le u \le 0$

$-2{,}5 \le v \le 2{,}5$

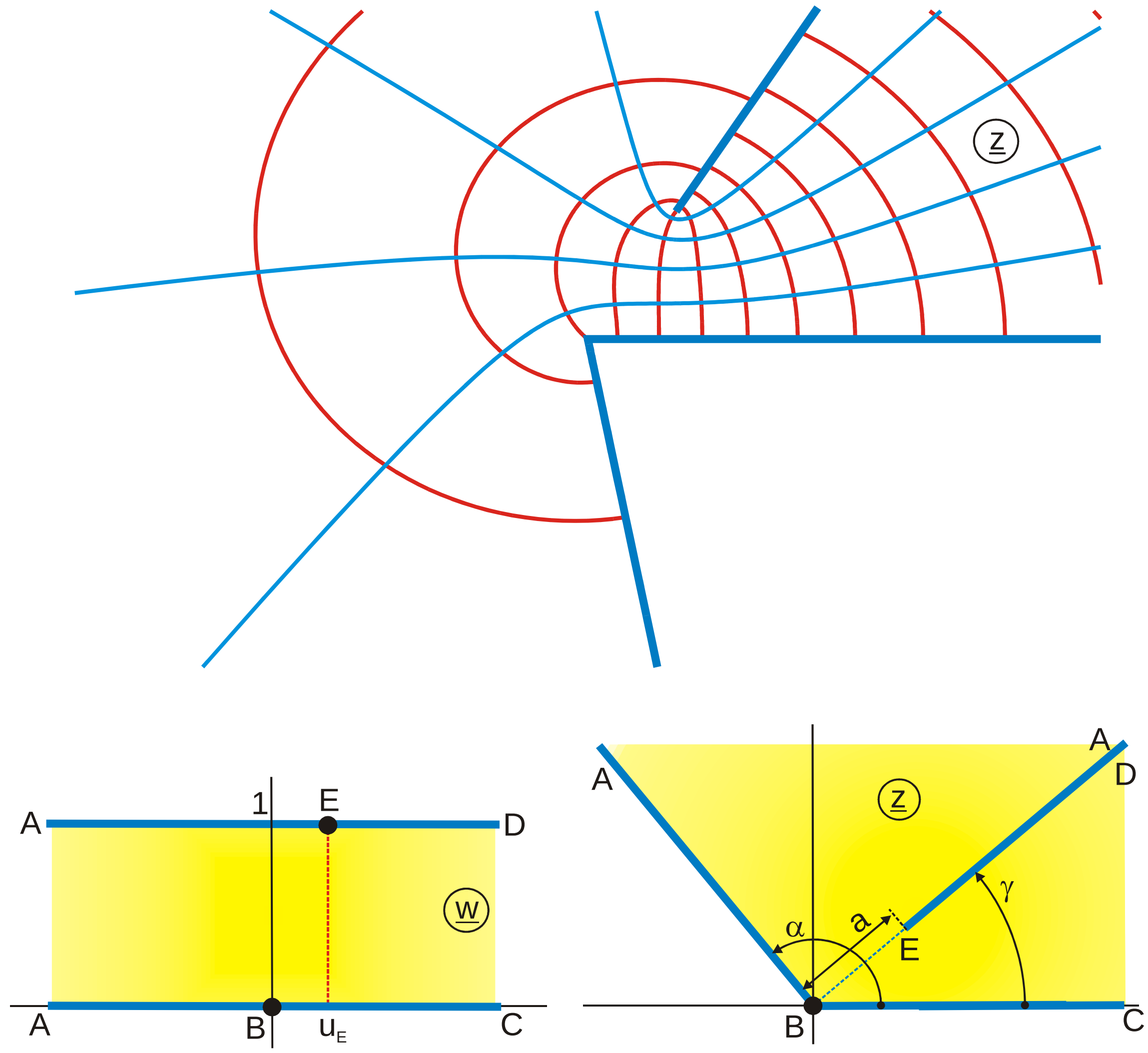


Abbildung D 2.5

$$z = w_1^{\alpha/\pi}$$

$$w_1 = \exp(\beta w) - \exp(\{\beta - \pi\} w)$$

$$a = \frac{\pi}{\beta}\left(\frac{\pi}{\beta} - 1\right)^{(\beta/\pi - 1)}$$

$$u_E = \frac{1}{\pi}\ln\left(\frac{\pi}{\beta} - 1\right)$$

gegeben: α, γ

$$\gamma = \frac{\beta}{\alpha}\pi$$

$-1 \le u \le 2$

$0 \le v \le 1$

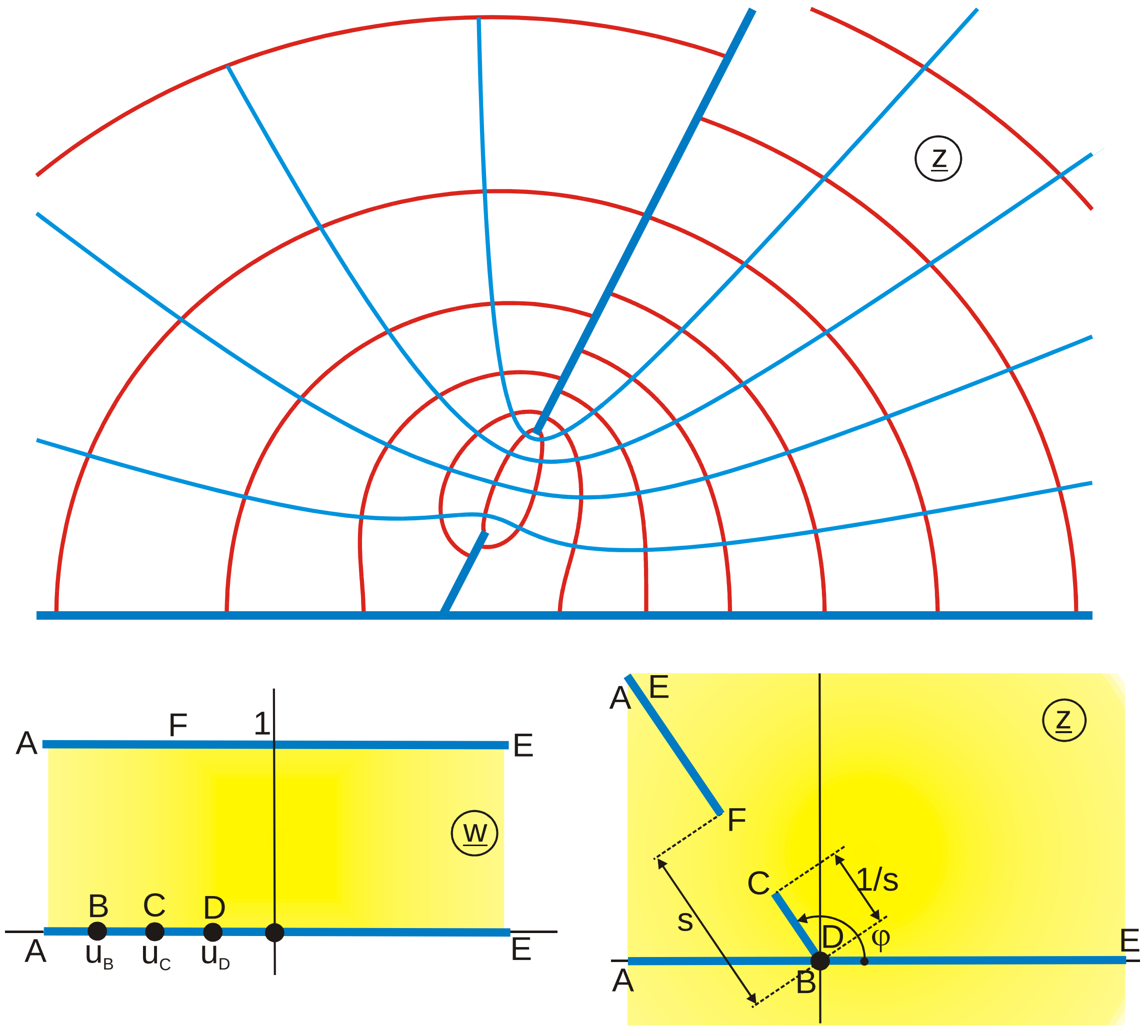


Abbildung D 2.6

$$z = \left(\frac{w_2 + a}{w_2 - a}\right)^f \left(\frac{w_2 + 1/a}{w_2 - 1/a}\right)^{f \cdot b}$$

$$w_2 = \frac{w_1/a - a}{w_1 - 1}$$

gegeben: φ, a

$w_1 = \exp(w\pi)$

$f = 1/(1+b) = 1 - \varphi/\pi$

$b = \varphi/(\pi - \varphi)$

$$s = \exp\left[2f\left\{\operatorname{ar\,tanh}(a/p) + b\operatorname{ar\,tanh}(ap)\right\}\right]$$

$$p = \sqrt{\frac{1 + a^2 b}{a^2 + b}}$$

$$u_B = \frac{1}{\pi}\ln\left(\frac{2}{1 + 1/a^2}\right)$$

$$u_C = \frac{1}{\pi}\ln\frac{p + a}{p + 1/a}$$

$$u_D = \frac{1}{\pi}\ln\frac{a^2 + 1}{2}$$

$-1{,}5 \le u \le 1{,}5$

$0 \le v \le 1$

$a = 0{,}2$

$\varphi = 67°$

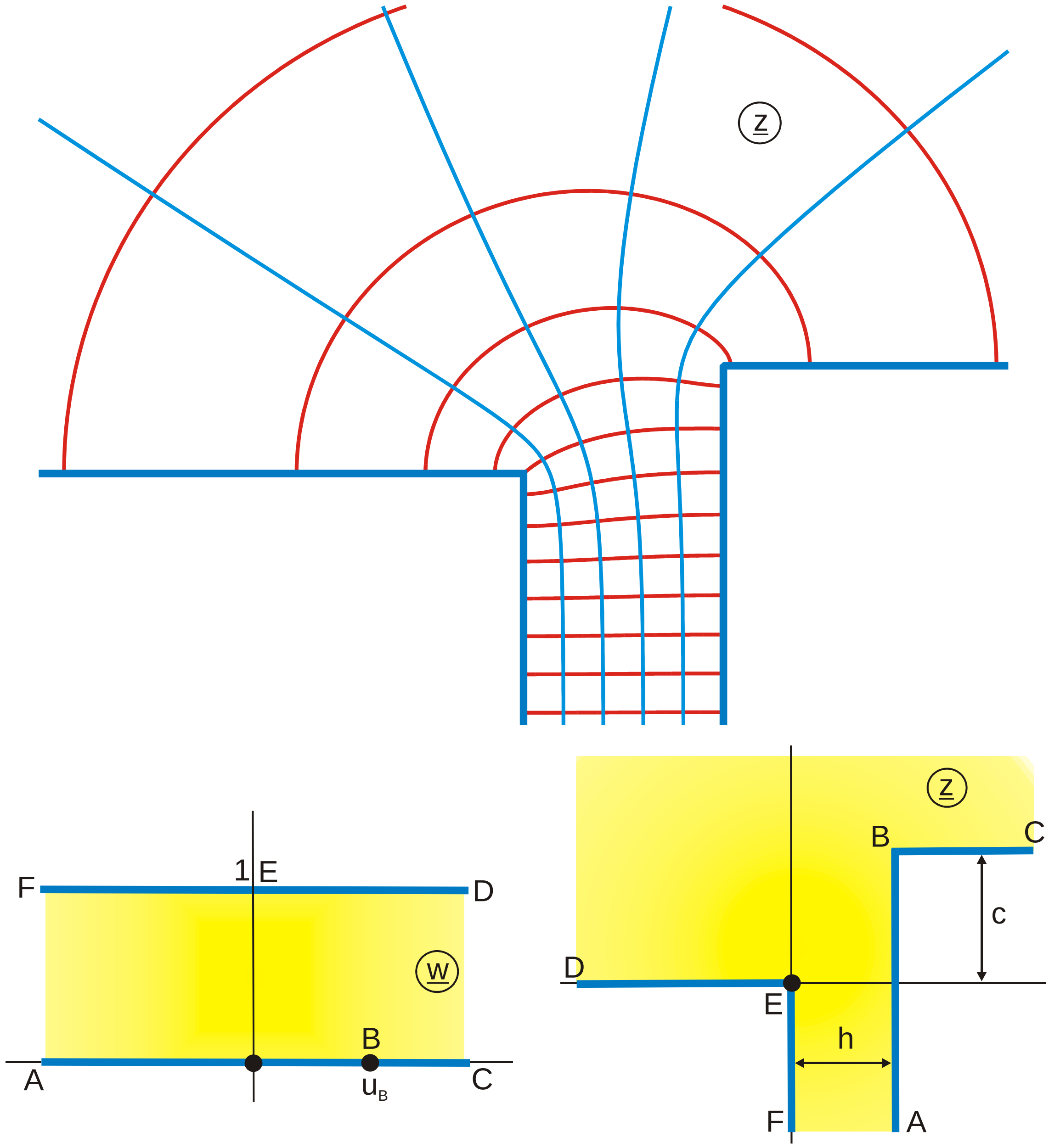


Abbildung D 3

$$z = \frac{w_1(a+1)}{w_1^{\,2}-1} + (1-a)\,ar\tanh w_1 + 2\sqrt{a}\,\arctan\left(\sqrt{a}\,w_1\right)$$

$$w_1 = \frac{\sqrt{w_0+1}}{\sqrt{w_0-1}}$$ $w_0 = \exp(w\pi)$

$c \geq 0$ $a = 1 + 2c/\pi$

$h = \pi\sqrt{a}$ $u_B = \frac{1}{\pi}\ln a$

$-2 \leq u \leq 2$ $0 \leq v \leq 1$

$c = 3$ $h = \pi$ für $c = 0$

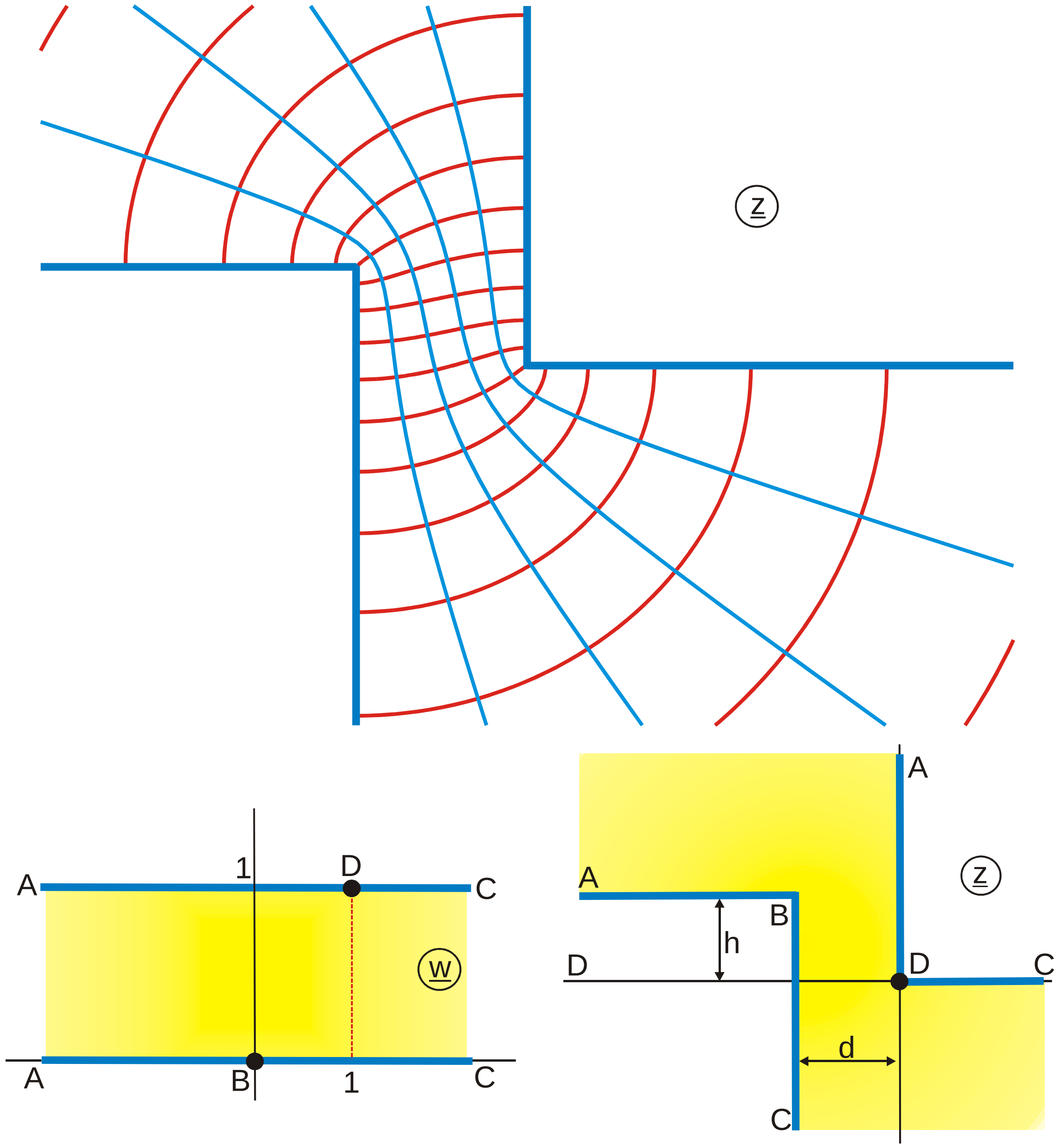


Abbildung D 3.1

$$z = F_t(w_1,k) - 2E_t(w_1,k) + \sqrt{1-k^2\sin^2 w_1}\,\tan w_1$$

$w_0 = \exp(w\pi)$

$$w_1 = \arccos\sqrt{-\left(\frac{k'}{k}\right)^2 \Big/ w_0}$$

$d = K(k) - 2\,E(k)$

$h = K'(k) - 2E'(k)$

$d = h$ für $k = 1/\mathrm{sqr}(2)$

$-1 \le u \le 3$

$0 \le v \le 1$

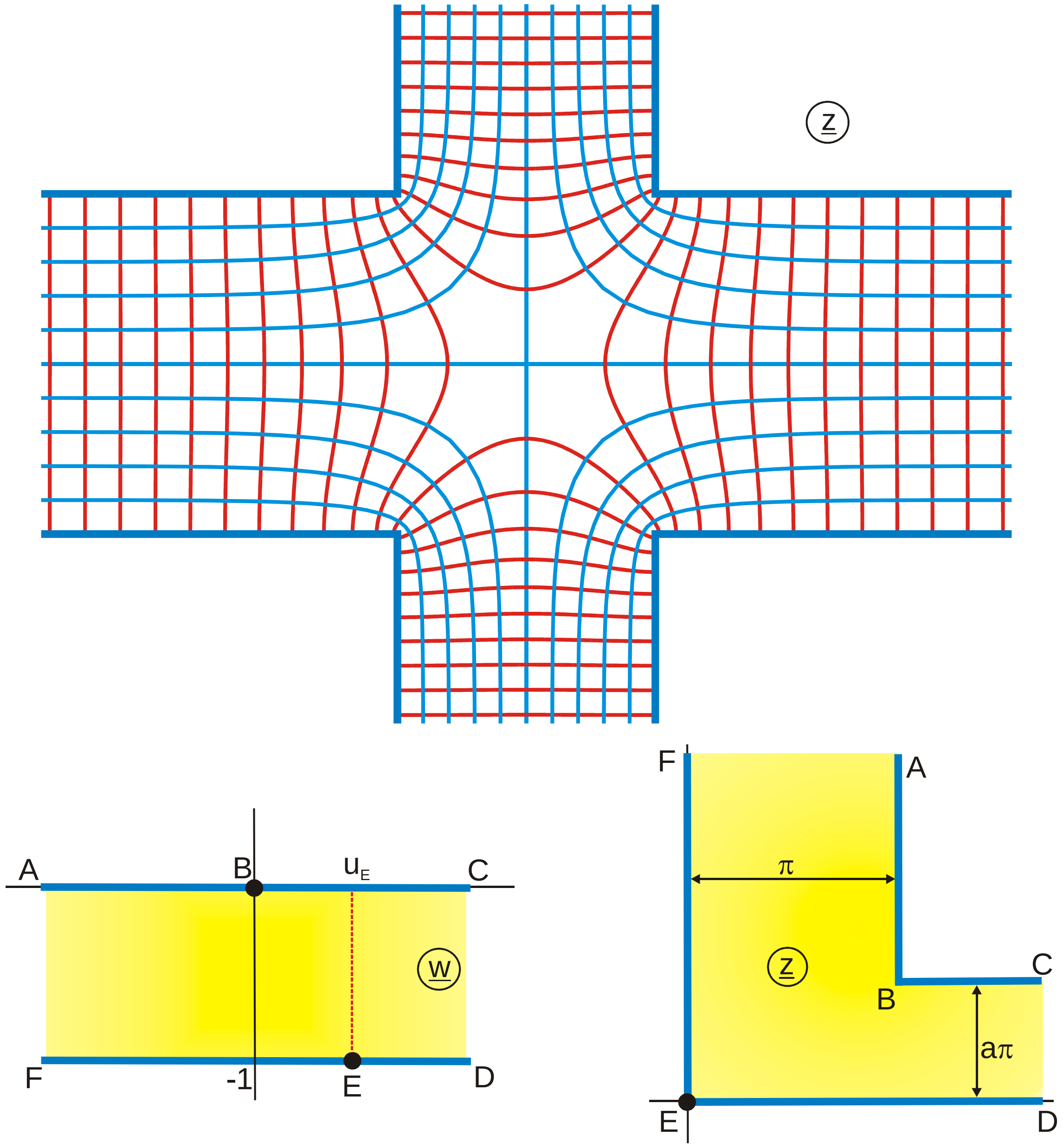


Abbildung D 4

$$z = 2a\,ar\tanh w_1 + 2\arctan(aw_1) + ja\pi + \pi$$

$$w_1 = \frac{\sqrt{w_0 - 1}}{\sqrt{w_0 + a^2}} \qquad w_0 = \exp(w\pi)$$

$$u_E = \frac{2}{\pi}\ln a$$

$-2{,}5 \le u \le 2{,}5$ $\qquad 0 \le v \le -1$

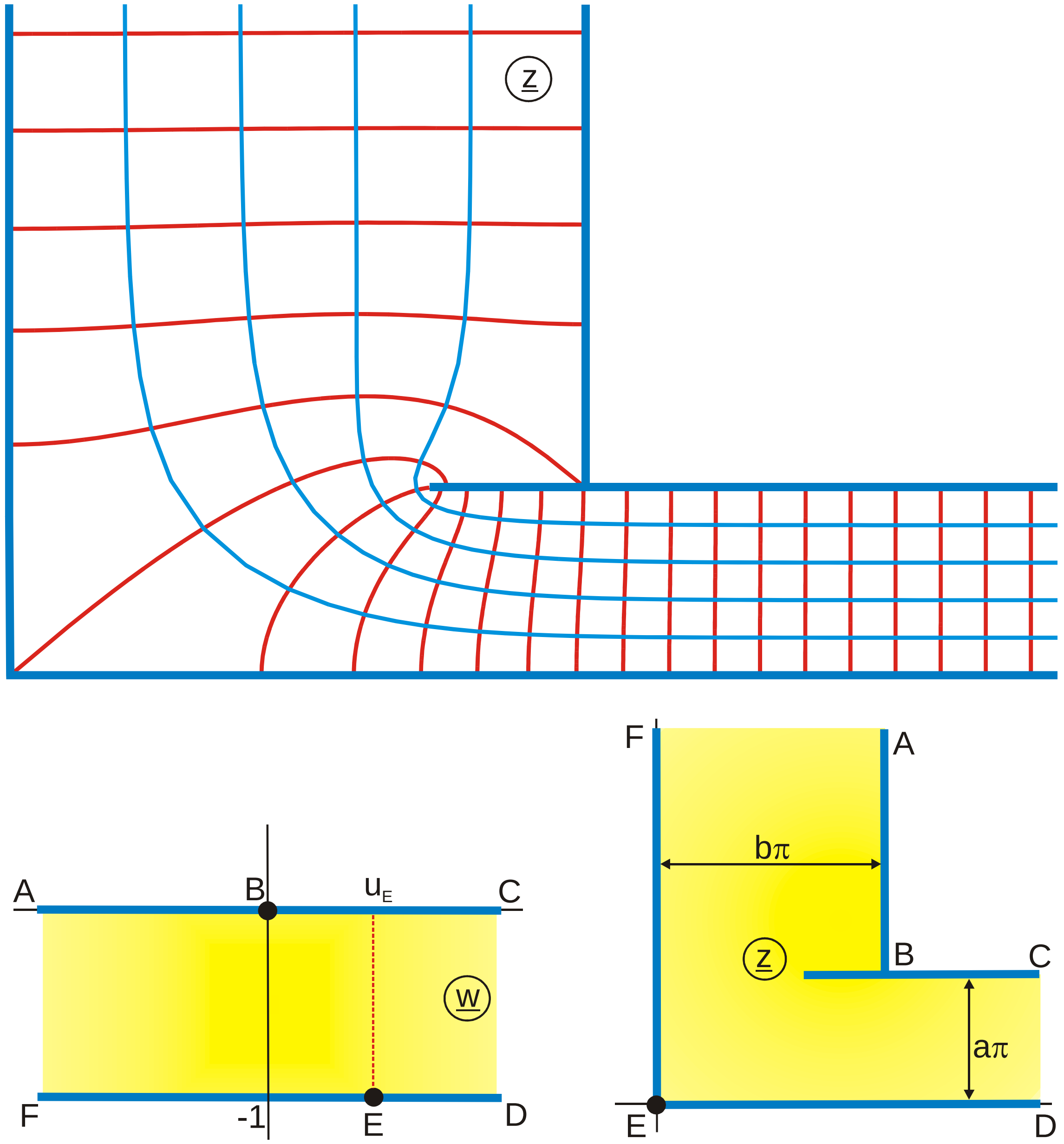


Abbildung D 4.1

$z = 2a \operatorname{ar\,tanh} w_1 - 2b \arctan(a w_1) + ja\pi + b\pi$

$w_1 = \dfrac{\sqrt{w_0 - 1}}{\sqrt{w_0 + a^2}}$ $\qquad$ $w_0 = \exp(w\pi)$

$u_E = \dfrac{2}{\pi} \ln a$

$-1 \leq u \leq 4$ $\qquad$ $0 \leq v \leq -1$

a = 1,3691 $\qquad$ b = 3,5

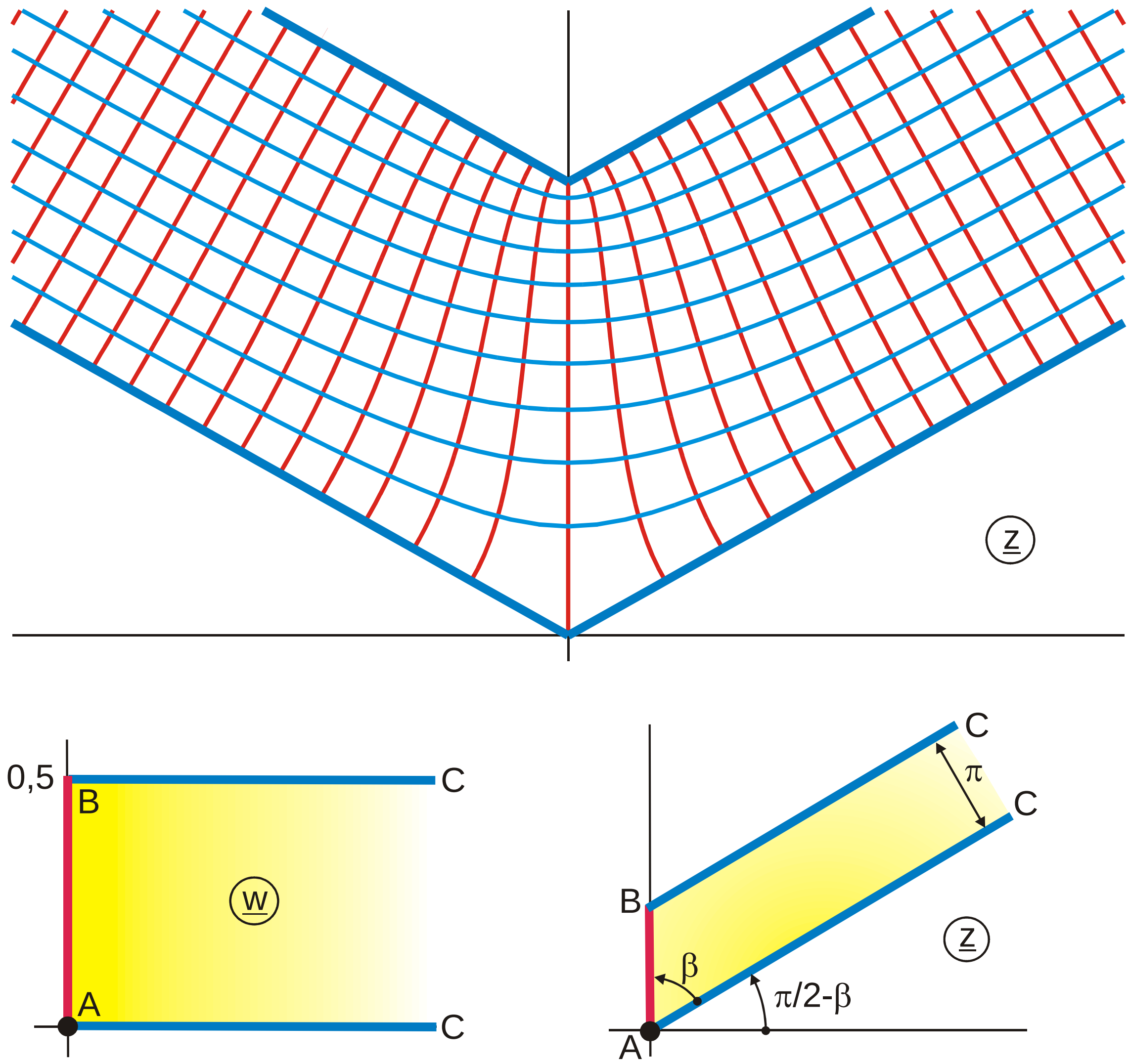


Abbildung D4.2

$$z = \sum_{i=0}^{q-1}\left[-t^{p}\ln\left(1-\frac{w_1}{t}\right)\right]\exp\left[j\left(\frac{\pi}{2}\right)-\beta\right]$$

$w_1 = \left(\tanh\{w\pi\}\right)^{2/q}$ $\qquad$ $t(i) = \exp\left(\frac{j2\pi i}{q}\right)$

$0 \le u \le 1$ $\qquad$ $0 \le v \le 0{,}5$

gegeben: p, q: >0 und ganzzahlig

$\beta = \pi\, p/q$ $\qquad$ $\beta = 60°$

$p = 1$ $\qquad$ $q = 3$

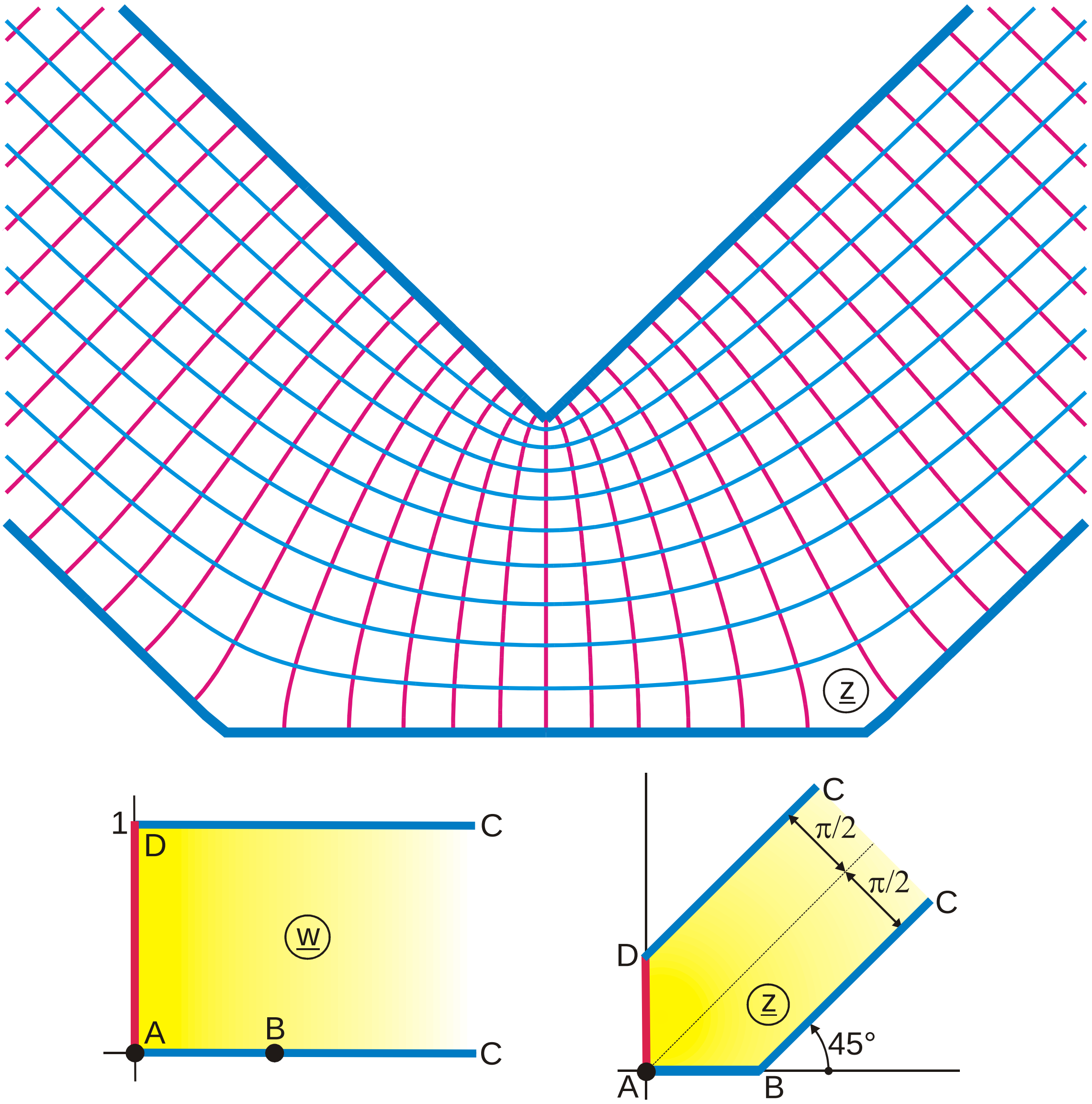


Abbildung D4.3

$$z = \frac{1}{2}\left\{\ln\frac{1+w_3}{1-w_3} + j\ln\frac{1-jw_3}{1+jw_3}\right\}\exp\left(j\frac{\pi}{4}\right)$$

$$w_3 = (1+j)\frac{w_2}{\sqrt{w_2{}^4-1}}$$

$$w_2 = \sqrt{1-\frac{1}{w_1{}^2}} - j\frac{1}{w_1}$$

$$w_1 = \sqrt{2}\,\frac{\exp(w\pi)-1}{\exp(w\pi)+1}$$

$$u_B = \frac{2}{\pi}\,ar\tanh\frac{1}{\sqrt{2}}$$

$0 \le u \le 2$

$0 \le v \le 1$

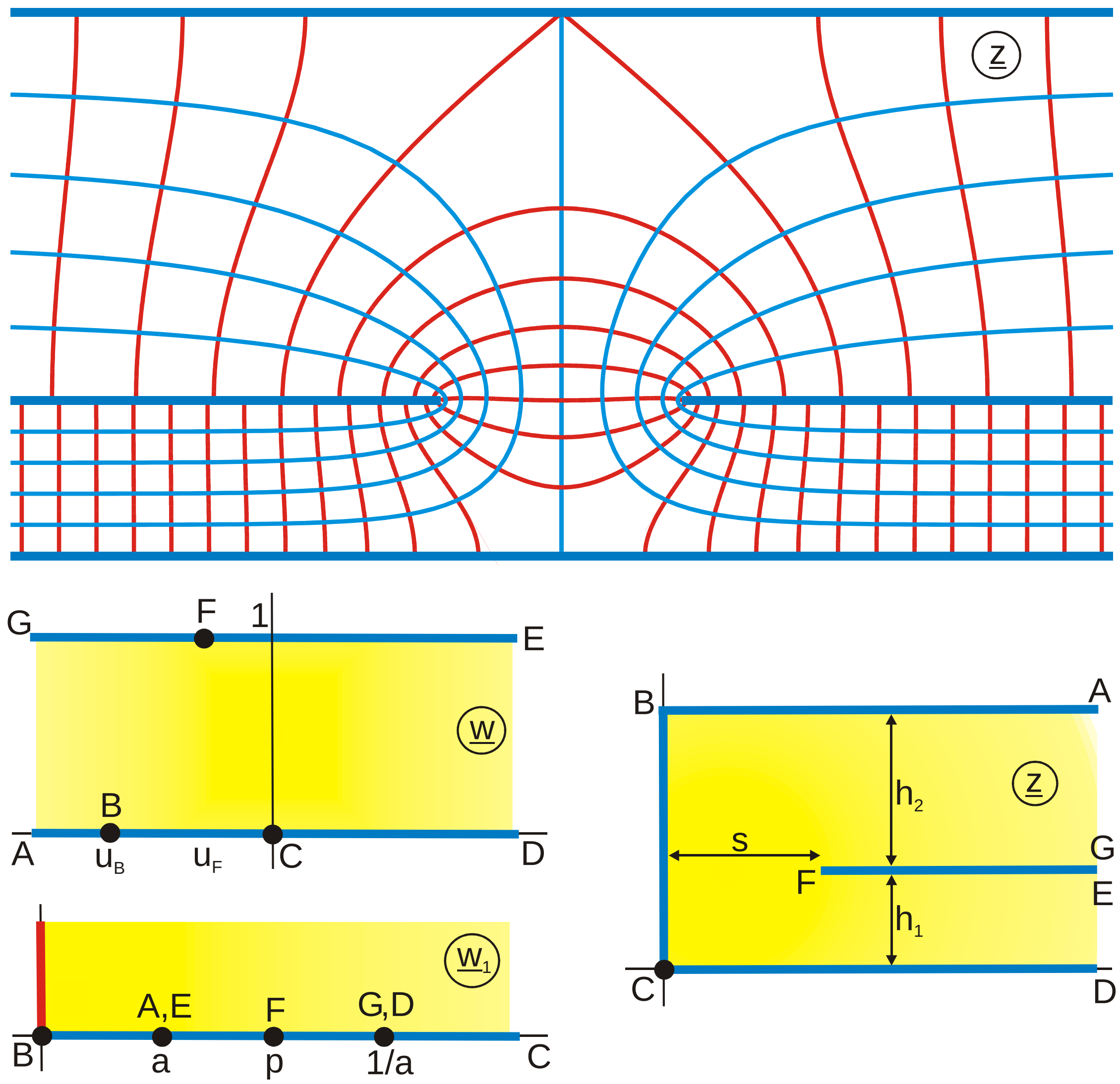


Abbildung D 5

$$z = 2\, ar\tanh\frac{a}{w_1} + 2b\,\mathrm{artanh}\frac{1}{aw_1}$$

$$w_1 = \frac{1}{a}\frac{\sqrt{w_0 - a^4}}{\sqrt{w_0 - 1}}$$

$w_0 = \exp(w\pi)$

$h_1 = \pi b$

$h_2 = \pi$

$$p = \sqrt{\frac{1 + a^2 b}{a^2 + b}}$$

$$u_B = \frac{4}{\pi}\ln a$$

$$s = 2\, ar\tanh\frac{a}{p} + 2b\, ar\tanh(pa)$$

$$u_F = \frac{1}{\pi}\ln\left(\frac{p^2a^2 - a^4}{1 - p^2a^2}\right)$$

$-2{,}5 \le u \le 2{,}5$

$0 \le v \le 1$

$a = 0{,}308$

$b = 0{,}4$

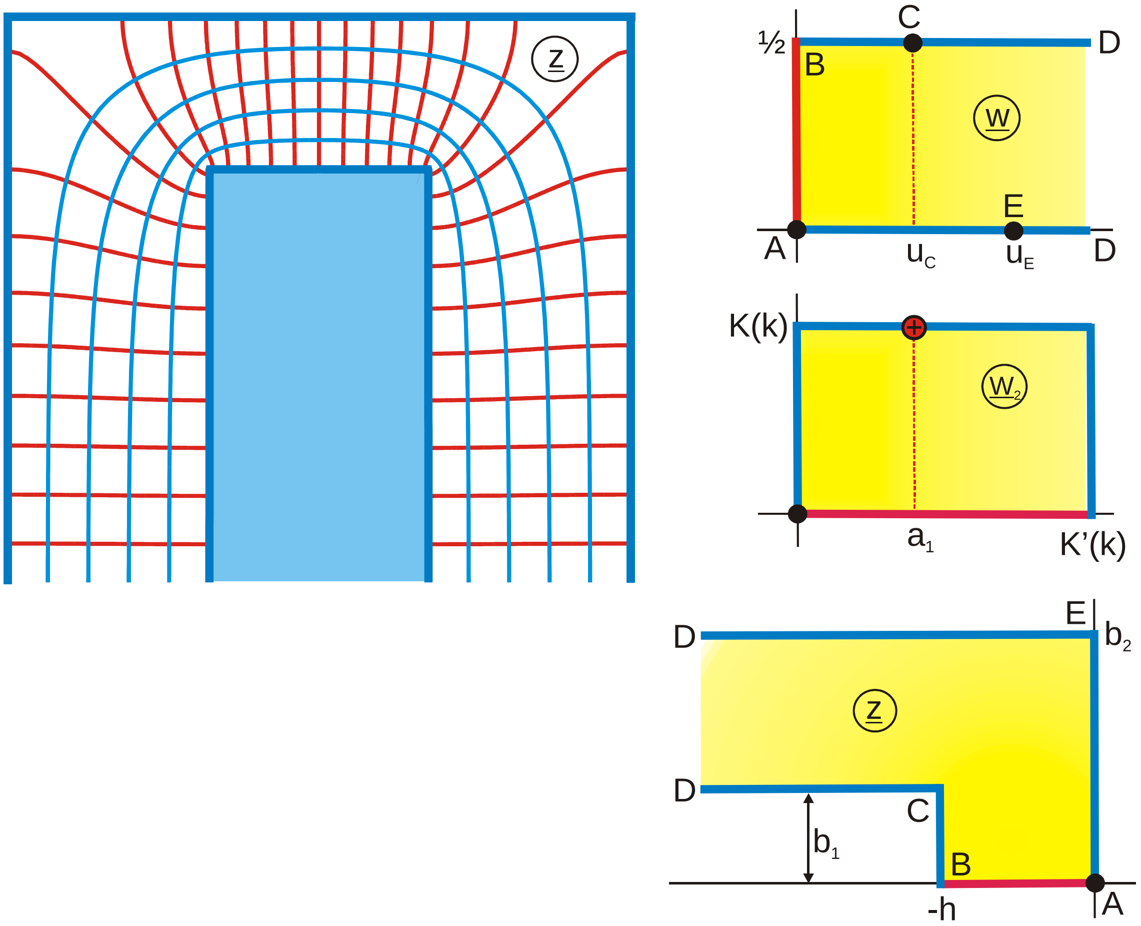


Abbildung D6

$$z = \Pi_e\left(w_2, k', a_1\right) - h$$

$$w_2 = jF_a\left(w_1, k\right) + K'(k)$$

$$w_1 = a\tanh(w\pi)$$

$$\text{gegeben}: \tau, d$$

$$b_1 = b\left\{K(k)Z_e(a_1,k') + \frac{\pi a_1}{2K'(k)}\right\} + K(k)$$

$$b_2 = b\left\{K(k)Z_e(a_1,k') + \frac{\pi a_1}{2K'(k)} - \frac{\pi}{2}\right\} + K(k)$$

$$a_1 = K'(k) - dK(k)$$

$$a = \operatorname{sn}\{K(k)+jdK(k),k\}$$

$$h = bK'(k)Z_e(a_1,k') + K'(k)$$

$$u_C = \frac{1}{\pi}\operatorname{ar}\tanh(ak)$$

$$u_E = \frac{1}{\pi}\operatorname{ar}\tanh\frac{1}{a}$$

$$k = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2$$

$$b = \frac{\operatorname{sn}(a_1,k')}{\operatorname{cn}(a_1,k')\operatorname{dn}(a_1,k')}$$

$0 \le u \le 2$ $\qquad$ $0 \le v \le 0{,}5$

$d = 0{,}25$ $\qquad$ $\tau = 0{,}7$

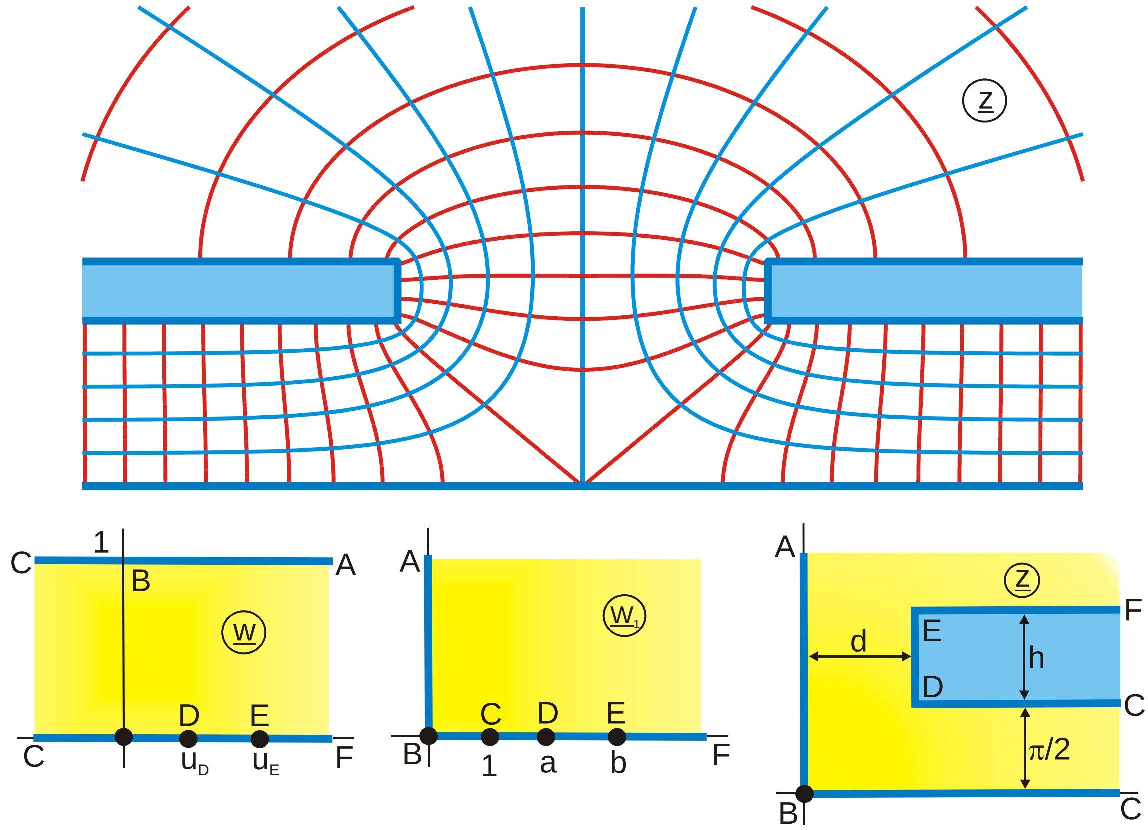


Abbildung D 6.1

$$z=\left(\sigma-\frac{1}{\lambda}\right)F_a\left(\frac{w_1}{a},k\right)+\lambda E_a\left(\frac{w_1}{a},k\right)+\frac{1}{\lambda}\Pi_a\left(\frac{w_1}{a},a^2,k\right)$$

$w_1=\sqrt{1+w_0}$ $\qquad$ $w_0=\exp(w\pi)$

$k=a/b$ $\qquad$ $a^2>k^2$

$$\sigma=a\sqrt{\frac{a^2-1}{a^2-k^2}} \qquad \lambda=\frac{a}{\sqrt{\left(a^2-1\right)\left(a^2-k^2\right)}}$$

$$d=K(k)\left\{\frac{\sigma}{b^2}-Z_a\left(\frac{1}{a},k\right)\right\} \qquad u_E=\frac{1}{\pi}\ln\left(b^2-1\right)$$

$$h=K'(k)\left\{a^2\lambda-\frac{1}{\lambda}-Z_a\left(\frac{1}{a},k\right)\right\}-\lambda E'(k)-\frac{\pi}{2K(k)}F_a\left(\frac{1}{a},k\right)$$

$$Z_a\left(\frac{1}{a},k\right)=Z_e\left\{F_a\left(\frac{1}{a},k\right),k\right\} \qquad u_D=\frac{1}{\pi}\ln\left(a^2-1\right)$$

$$\sigma\lambda=1/\mathrm{dn}^2\left\{F_a(1/a,k)\right\}$$

$-2\le u\le 2$ $\qquad$ $0\le v\le 1$

$k=0{,}375$ $\qquad$ $b=4$ $\qquad$ $a=1{,}5$

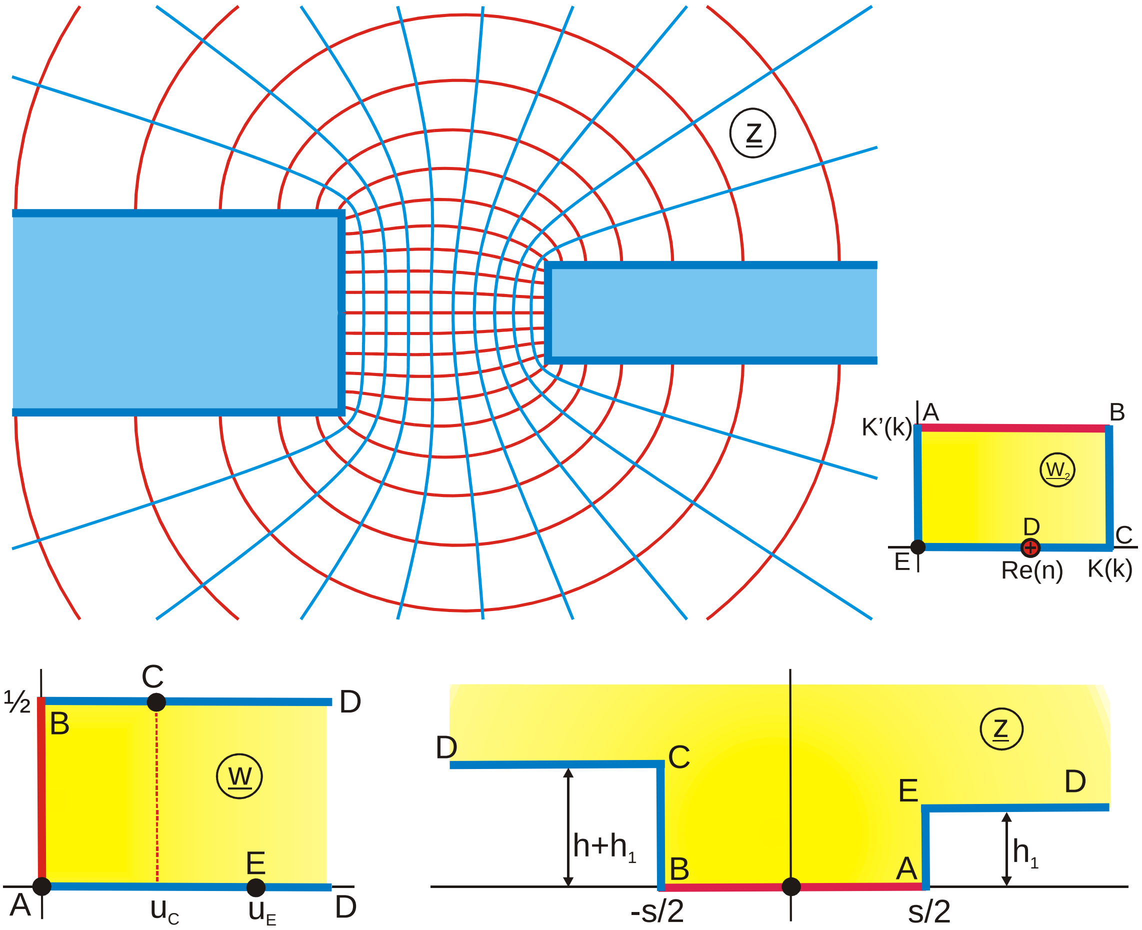


Abbildung D 6.2

$$z = \frac{a^4\, \mathrm{sn\,cn\,dn}(w_2,k)}{1-a^2\,\mathrm{sn}^2(w_2,k)} - a^2\, E_e(w_2,k) - (a^2-k^2)w_2 - g\,\Pi_e(w_2,k,n) + \frac{s}{2} + jh_1$$

$g = a^4 - 2a^2 + k^2$

$k = \frac{(1-b)d}{d-b}$

$w_2 = j\left[K'(k) - F_a(w_1,k')\right]$

$w_1 = f\,\tanh(w\pi)$

$n = F_a\left(a/k,k\right)$

$f = \mathrm{Re}\,\mathrm{sn}(-jn,k')$

gegeben: $b < 1$ und $d > 1$

$a = \mathrm{sqr}(d)$

$s = d\,E(k) + (d-k^2)K(k) + g\,\Pi(k,1-d)$

$\mathrm{Im}\,(n) = K'(k)$

$h = -g\,\mathrm{Im}\left\{\Pi_e(K(k),k,n\right\}$

$h = 0$ für $d = 1 + b$

$$h_1 = d\left[K'(k) - E'(k)\right] + (d-k^2)\,K'(k) + g\,\mathrm{Im}\left\{\Pi_e\left[K(k) + jK'(k),k,n\right]\right\}$$

$u_C = \frac{1}{\pi} ar\tanh(fk')$

$u_E = \frac{1}{\pi} ar\tanh(1/f)$

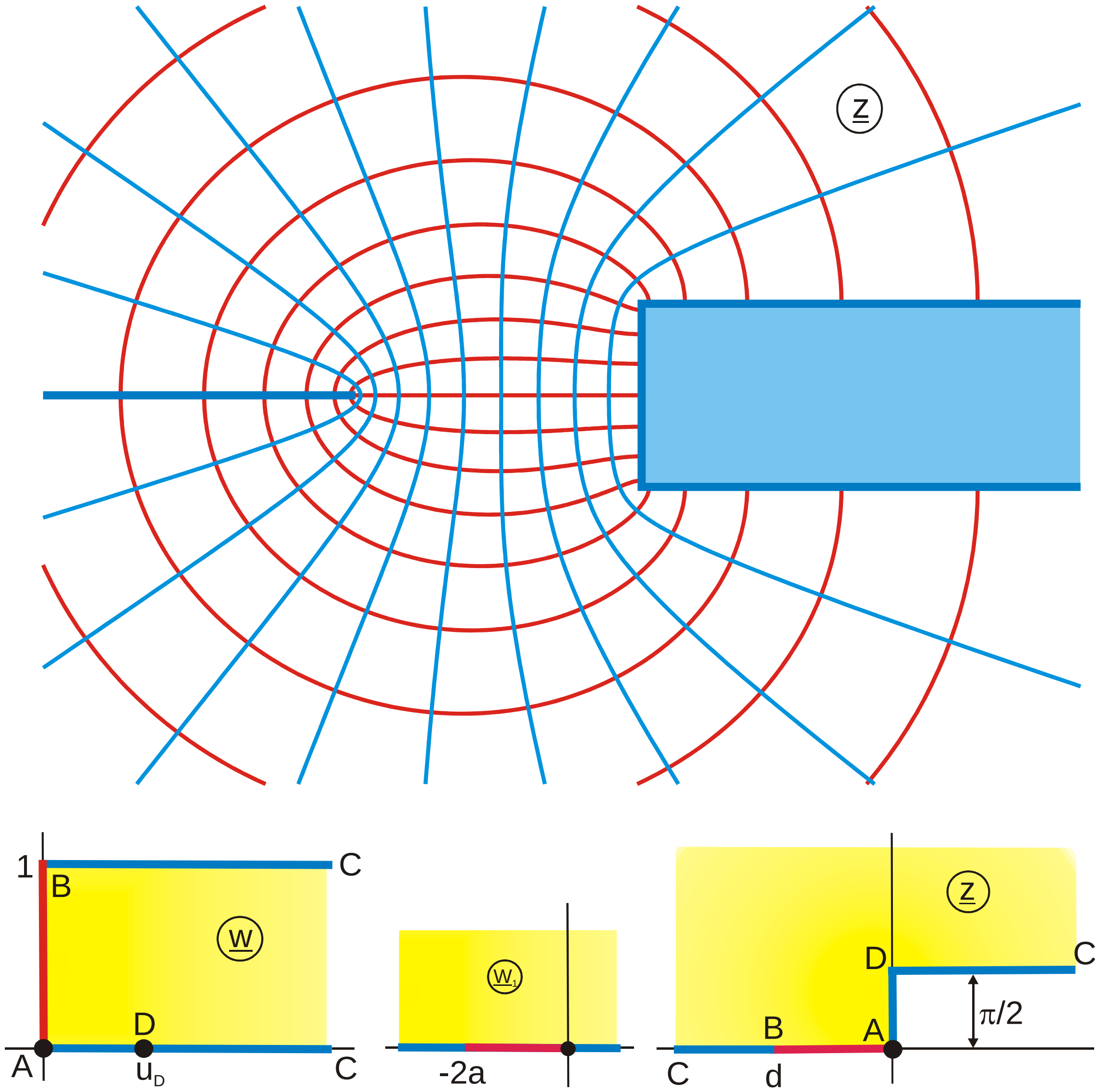


Abbildung D 6.3

$$z = \sqrt{w_1(w_1 - 1)} + j\arcsin\sqrt{w_1}$$

$$w_1 = a\left[\cosh(w\pi) - 1\right]$$

$$u_D = \frac{1}{\pi} ar\cosh(1 + 1/a)$$

$$d = \sqrt{4a^2 + 2a} + ar\sinh\sqrt{2a}$$

$0 \leq u \leq 1$

$0 \leq v \leq 1$

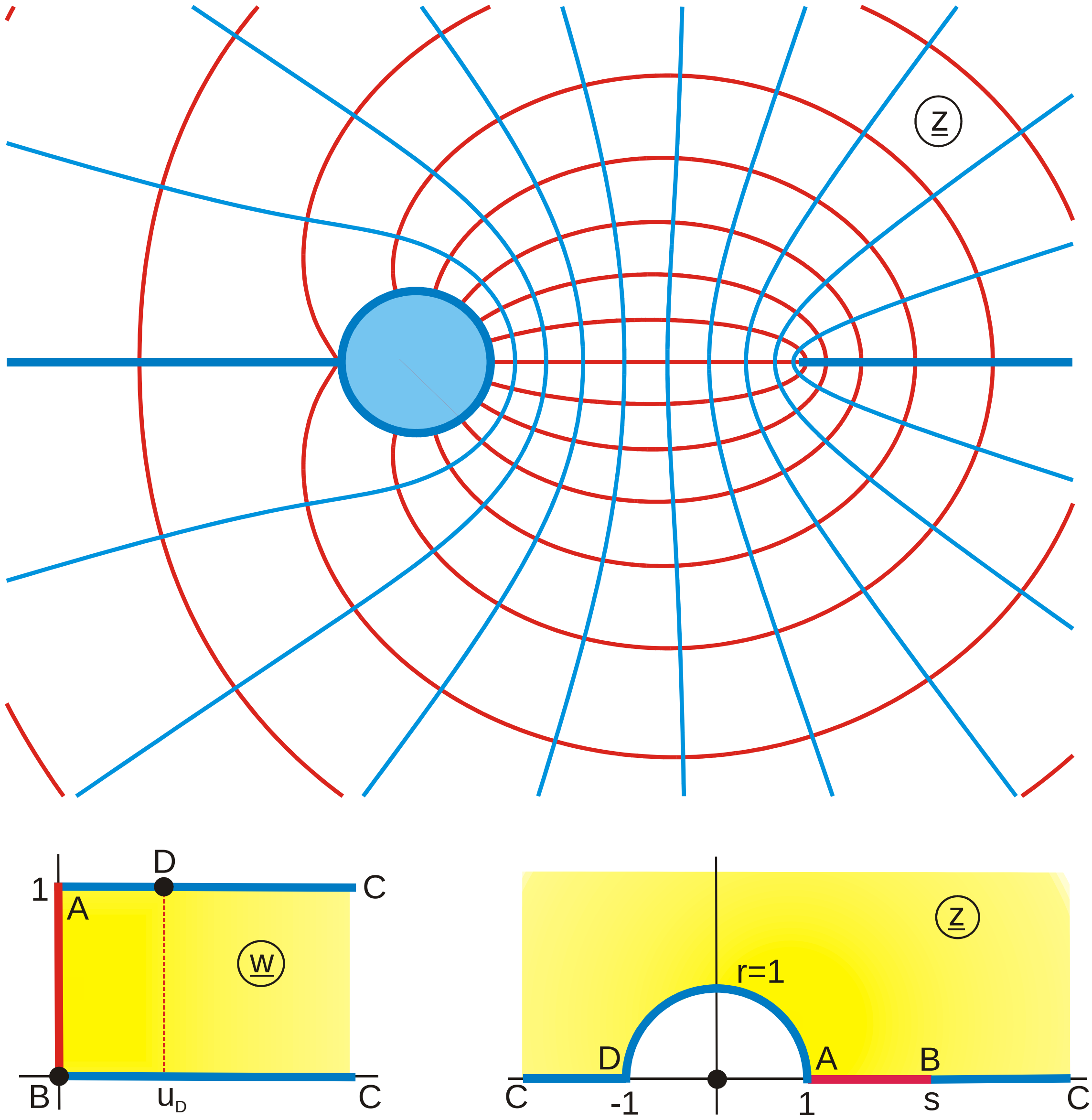


Abbildung D 7

$$z = \exp(w_2)$$

$$w_2 = j\left\{\frac{\pi}{2} - \arcsin w_1\right\}$$

$$w_1 = \frac{a}{2}\{\cosh(w\pi) + 1\} + 1$$

$$u_D = \frac{1}{\pi} \operatorname{ar\,cosh}(1 + 4/a)$$

$$a = \cosh(\ln s) - 1$$

$0 \le u \le 2$

$0 \le v \le 1$

$s = 5{,}187$

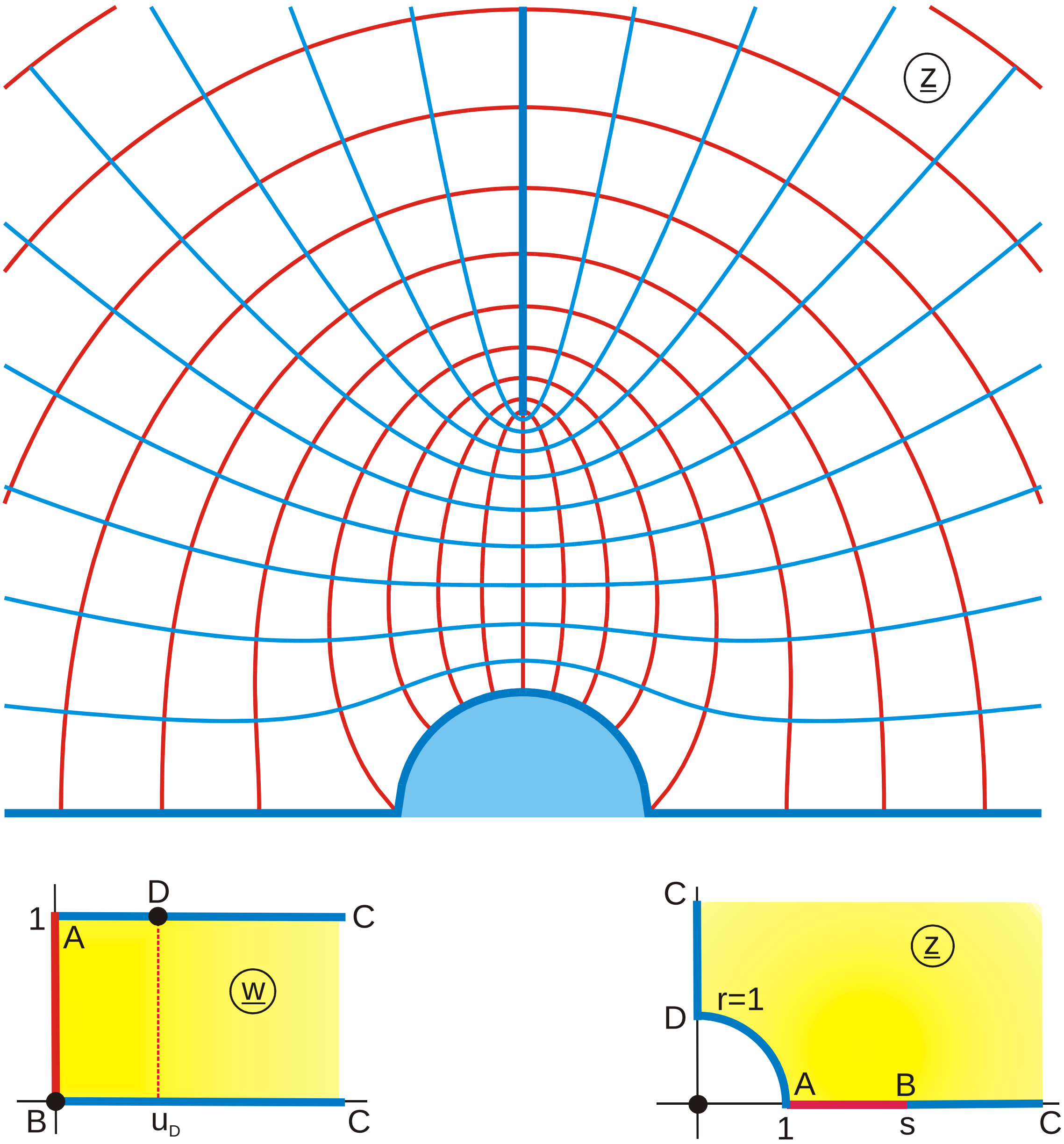


Abbildung D 7.1

$$z = \exp(w_2/2)$$

$$w_2 = j\left\{\frac{\pi}{2} - \arcsin w_1\right\}$$

$$w_1 = \frac{a}{2}\{\cosh(w\pi) + 1\} + 1$$

$$u_D = \frac{1}{\pi}\operatorname{ar}\cosh(1 + 4/a)$$

$$a = \cosh(2\ln s) - 1$$

$0 \le u \le 1$

$0 \le v \le 1$

$s = 3{,}2872$

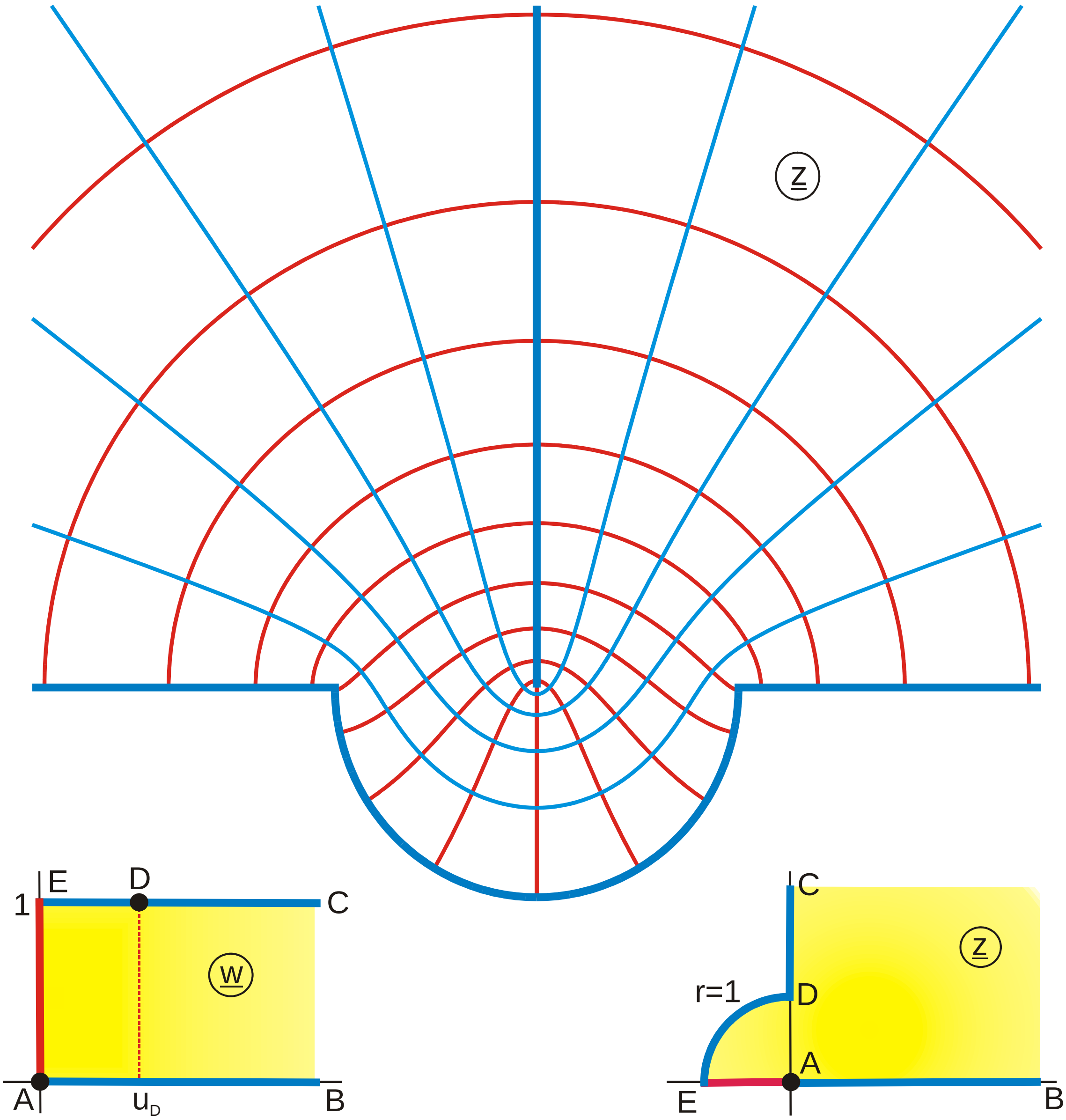


Abbildung D 7.2

$$z = -\exp(w_2)$$

$$w_2 = \frac{1}{2}\operatorname{ar\,cosh}\frac{5w_1 - 2}{3w_1} - \operatorname{ar\,cosh}\frac{8w_1 - 5}{3}$$

$$w_1 = 1 - \left(\frac{1 + w_0}{1 - w_0}\right)^2$$

$$w_0 = \exp(\pi w)$$

$$u_D = \frac{2}{\pi}\operatorname{ar\,tanh}\sqrt{\frac{3}{4}}$$

$0 \le u \le 2$

$0 \le v \le 1$

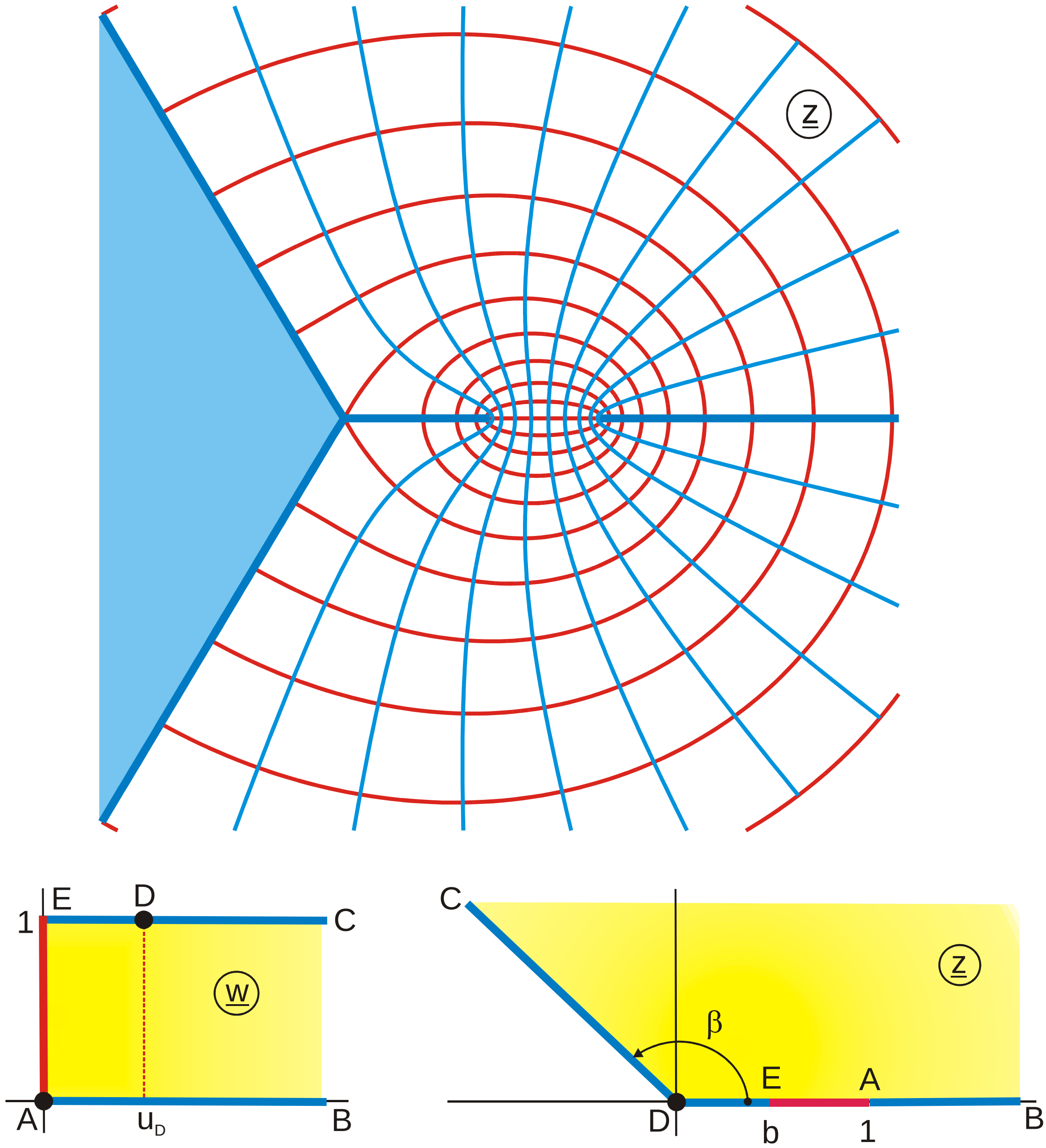


Abbildung D 7.3

$$z = \left[\frac{w_1 + 1/2 + h}{1 + h} \right]^{\beta/\pi}$$

$$w_1 = \left(w_0 + 1/w_0 \right)/4$$

$w_0 = \exp(w\pi)$

$$h = \frac{b^{\pi/\beta}}{1 - b^{\pi/\beta}}$$

$$u_D = \frac{1}{\pi} ar\cosh(2h+1)$$

$0 \le u \le 1$

$0 \le v \le 1$

b = 0,5698

β = 120°

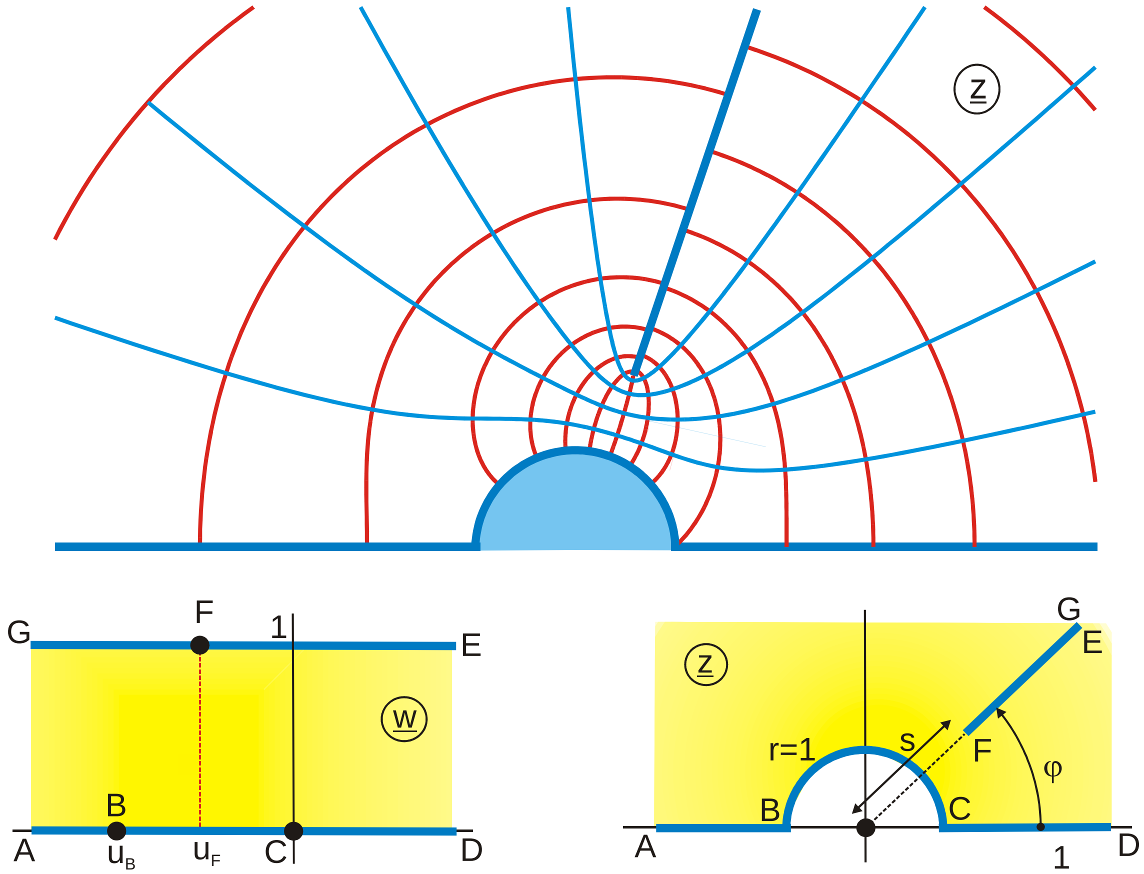


Abbildung D 7.4

$$z = \left(\frac{w_2 + a}{w_2 - a}\right)^f \left(\frac{w_2 + 1/a}{w_2 - 1/a}\right)^{f \cdot b}$$

$$w_2 = \frac{1}{a}\sqrt{\frac{w_1 - a^4}{w_1 - 1}}$$

gegeben: φ, a

$w_1 = \exp(w\pi)$

$f = 1/(1+b) = 1 - \varphi/\pi$

$b = \varphi/(\pi-\varphi)$

$$s = \exp\left[2f\left\{\operatorname{ar\,tanh}(a/p) + b\,\operatorname{ar\,tanh}(ap)\right\}\right]$$

$$p = \sqrt{\frac{1 + a^2 b}{a^2 + b}}$$

$$u_B = \frac{4}{\pi}\ln a$$

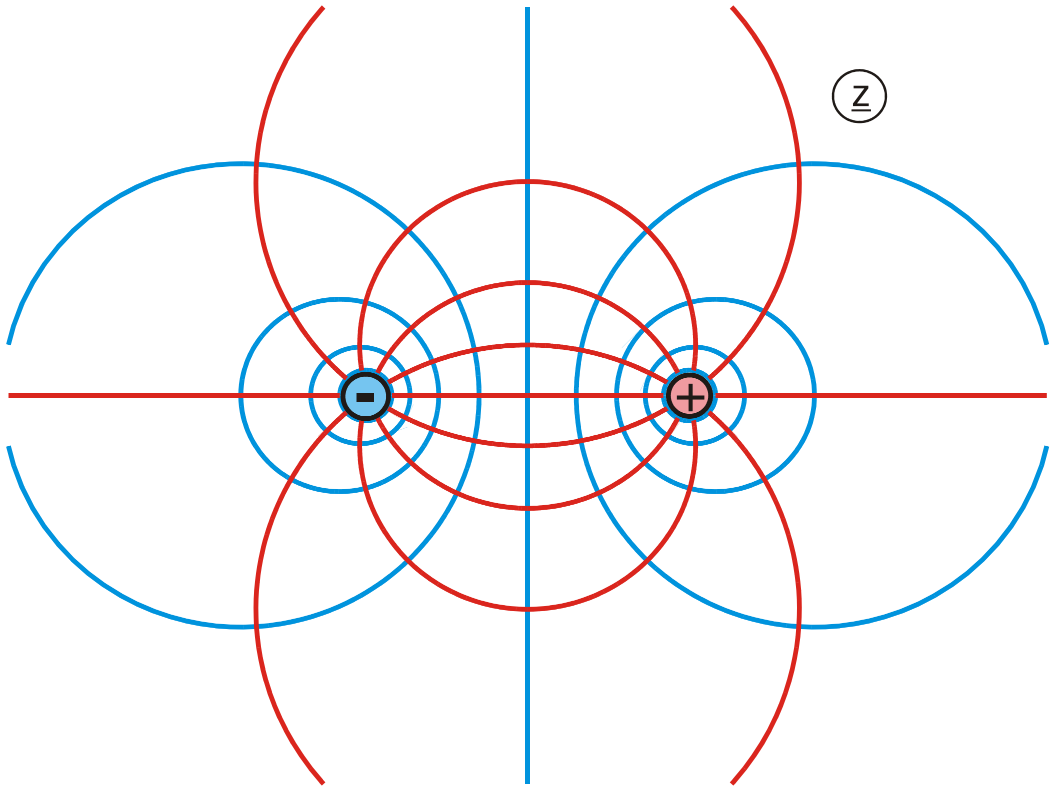
$$u_F = \frac{1}{\pi}\ln\frac{p^2a^2 - a^4}{1 - p^2a^2}$$

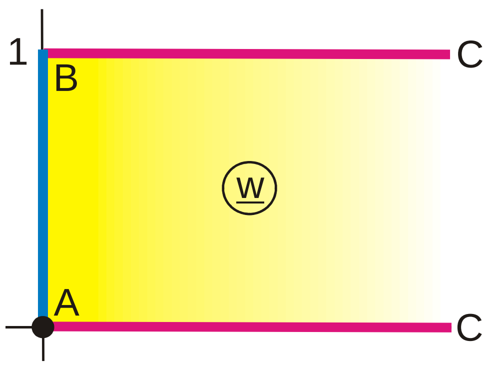
$-2 \le u \le 2$

$0 \le v \le 1$

Abbildungen Gruppe E

Zwei leitende Elektroden endlicher Ausdehnung, symmetrisch angeordnet, entgegengesetzt gleich große Ladung





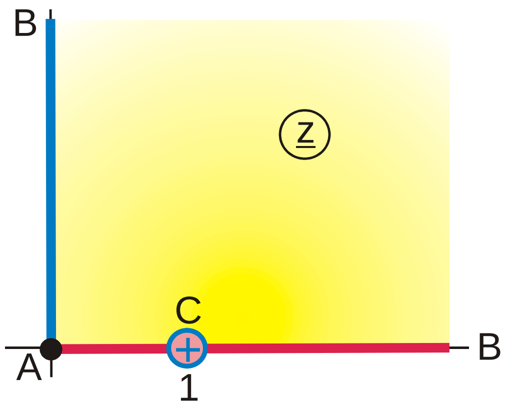


Abbildung E 1 (bipolares Koordinatensystem, Kreise des Apollonius)

$z = \tanh(w\pi)$

$0 \le u \le 0{,}8$ $\quad$ $0 \le v \le 0{,}5$

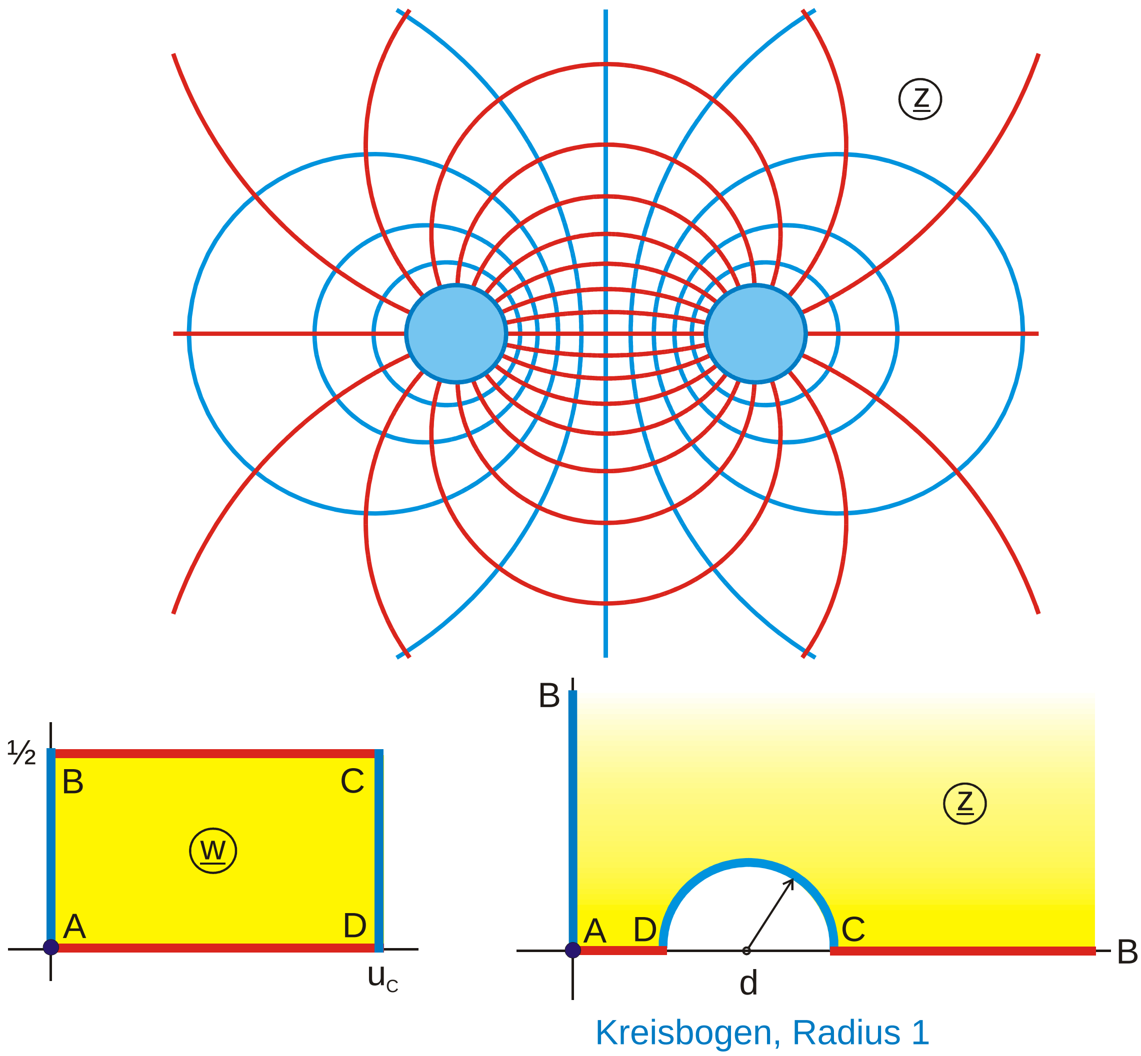


Abbildung E 1.1

$$z = \frac{1}{R} \tanh(w\pi)$$

$$R = \frac{1}{\sinh(2\pi u_C)}$$

$$u_C = \frac{1}{2\pi} \operatorname{ar\,sinh} \sqrt{d^2 - 1}$$

$0 \le u \le u_C$ $\qquad$ $0 \le v \le 0{,}5$

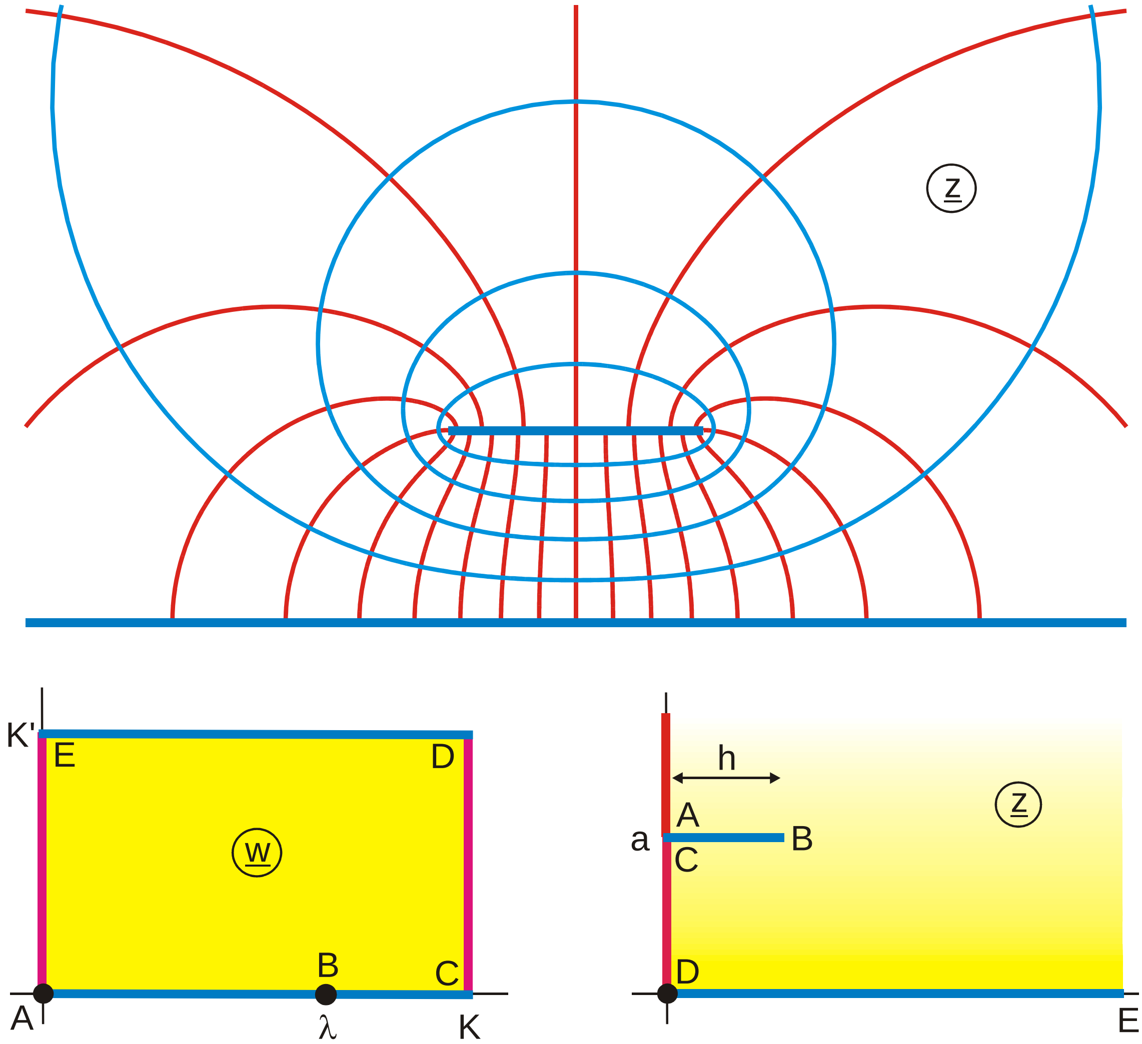


Abbildung E 2

$z = Z_e(w, k) + ja$

$a = \pi/(2K)$

$h = Z_e(\lambda, k)$

$\lambda = F_a\left(\frac{1}{k}\sqrt{1 - \frac{E}{K}}, k\right)$

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

gegeben: k

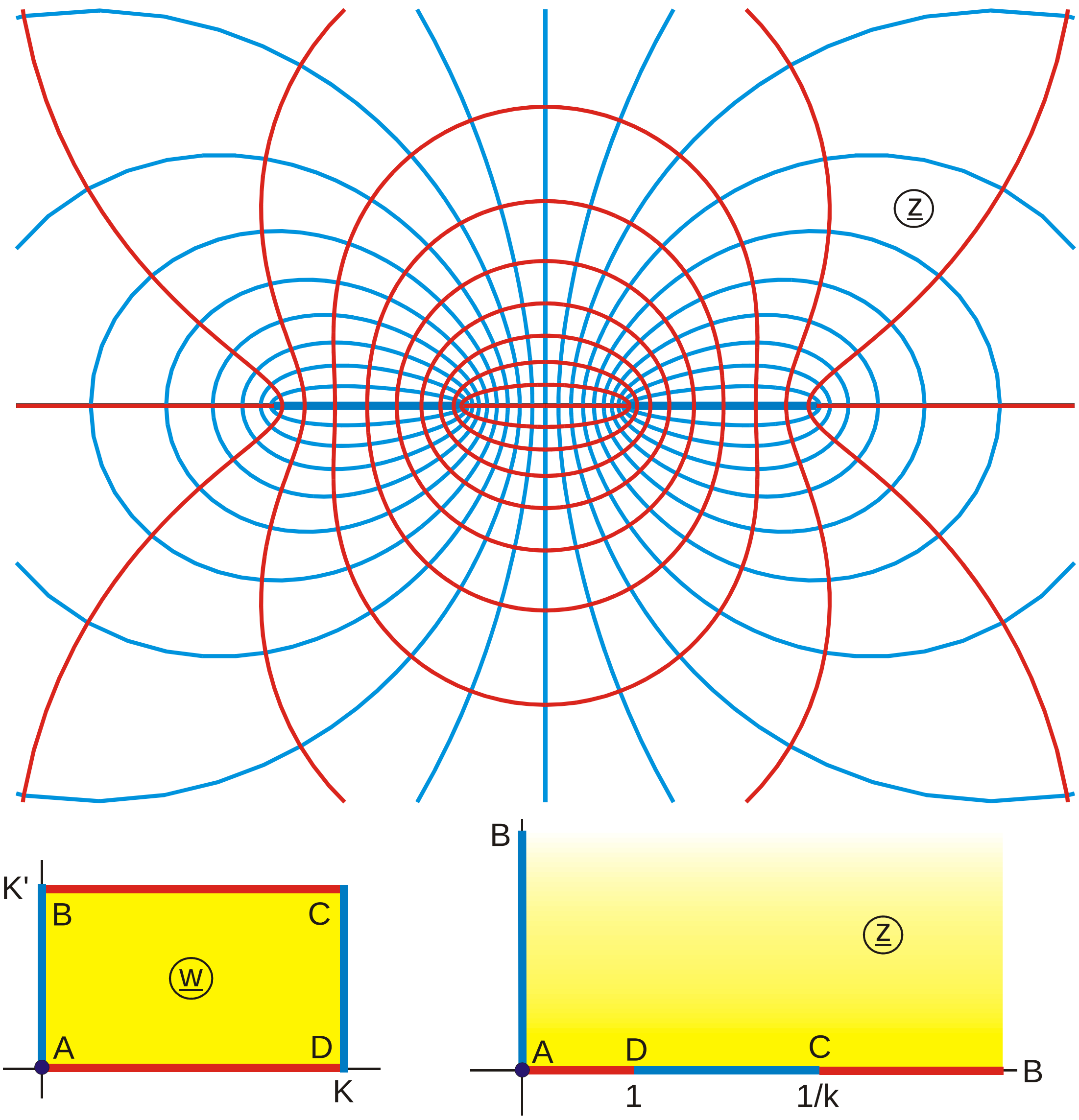


Abbildung E 3

z = sn (w,k)

0 ≤ u ≤ K

0 ≤ v ≤ K'

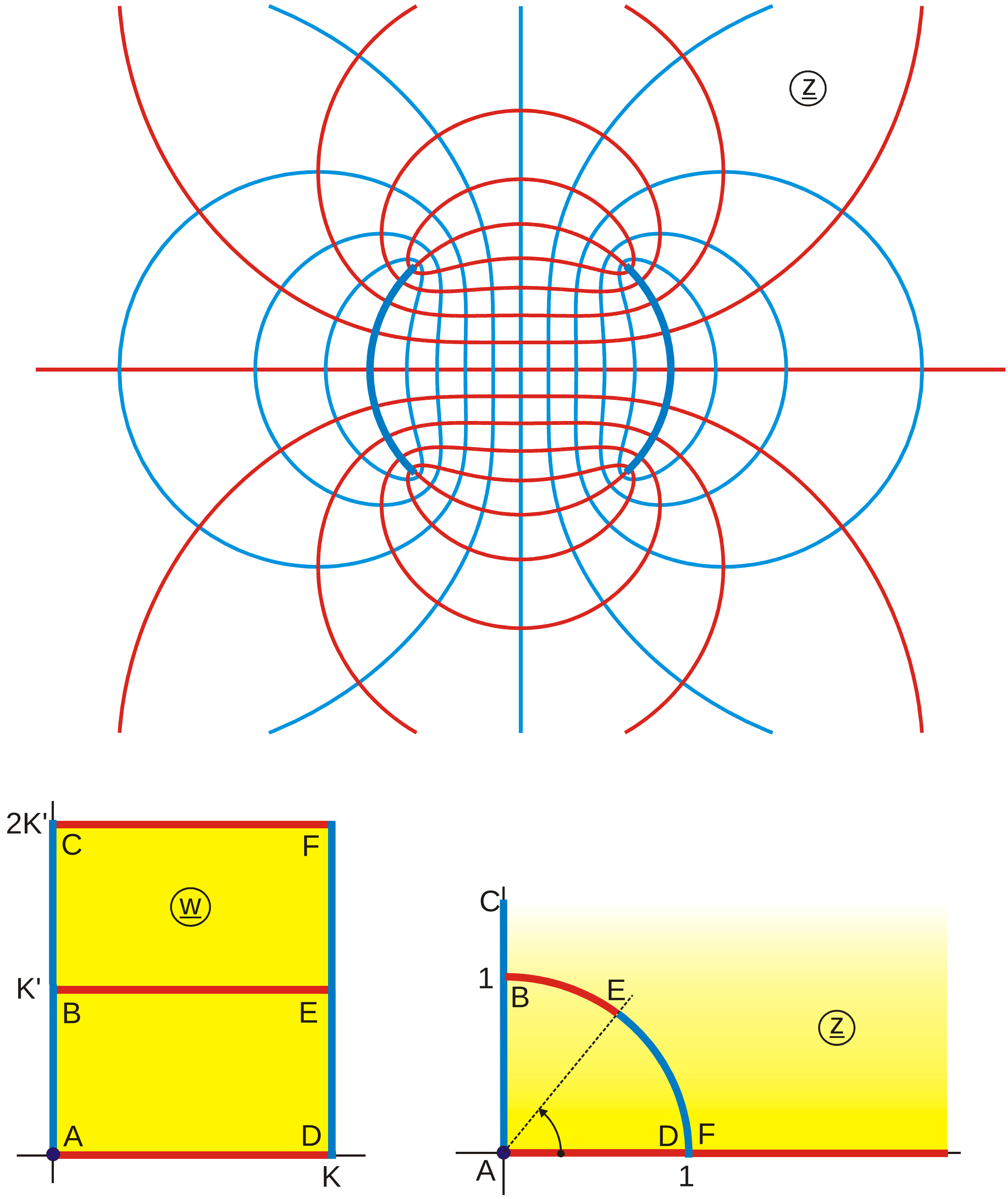


Abbildung E 4

$$z = \sqrt{\frac{1 - \mathrm{cn}(w,k)}{1 + \mathrm{cn}(w,k)}}$$

$k = \cos\beta$

$0 \le u \le 2K'$ $\qquad$ $0 \le v \le K$

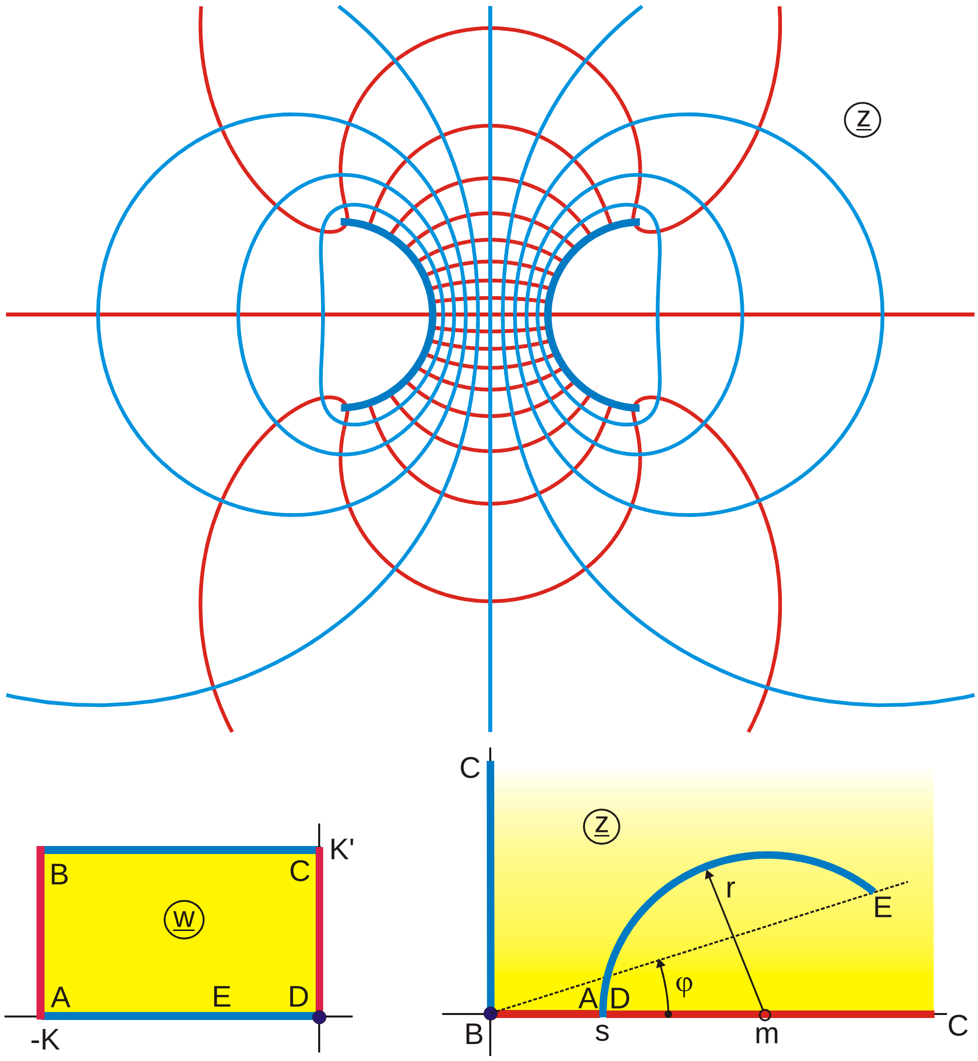


Abbildung E 4.1

$$z = \frac{1-w_1}{1+w_1}$$

gegeben: s,k

$$w_1 = q\,\frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w+ja),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w-ja),\tau\right]}$$

$$q = \frac{1-s}{1+s}$$

$$\tau = \frac{K'(k)}{K(k)}$$

$$a = -\frac{K(k)}{\pi}\ln q$$

m = (s + 1/s)/2

r = (1/s-s)/2

$$\sigma = \frac{Z_e(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja)+\mathrm{sn}(ja)\,Z_e(ja)\right]}$$

$$\varphi = \arg\frac{1-q\,\exp(-j\alpha)}{1+q\,\exp(-j\alpha)}$$

$$\alpha = 2\arg\vartheta_4\left[\frac{\pi}{2K(k)}(-u_E+ja),\tau\right]$$

$$u_E = -F_a\left(\sqrt{\sigma},k\right)$$

-K(k) ≤ u ≤ 0

0 ≤ v ≤ K'(k)

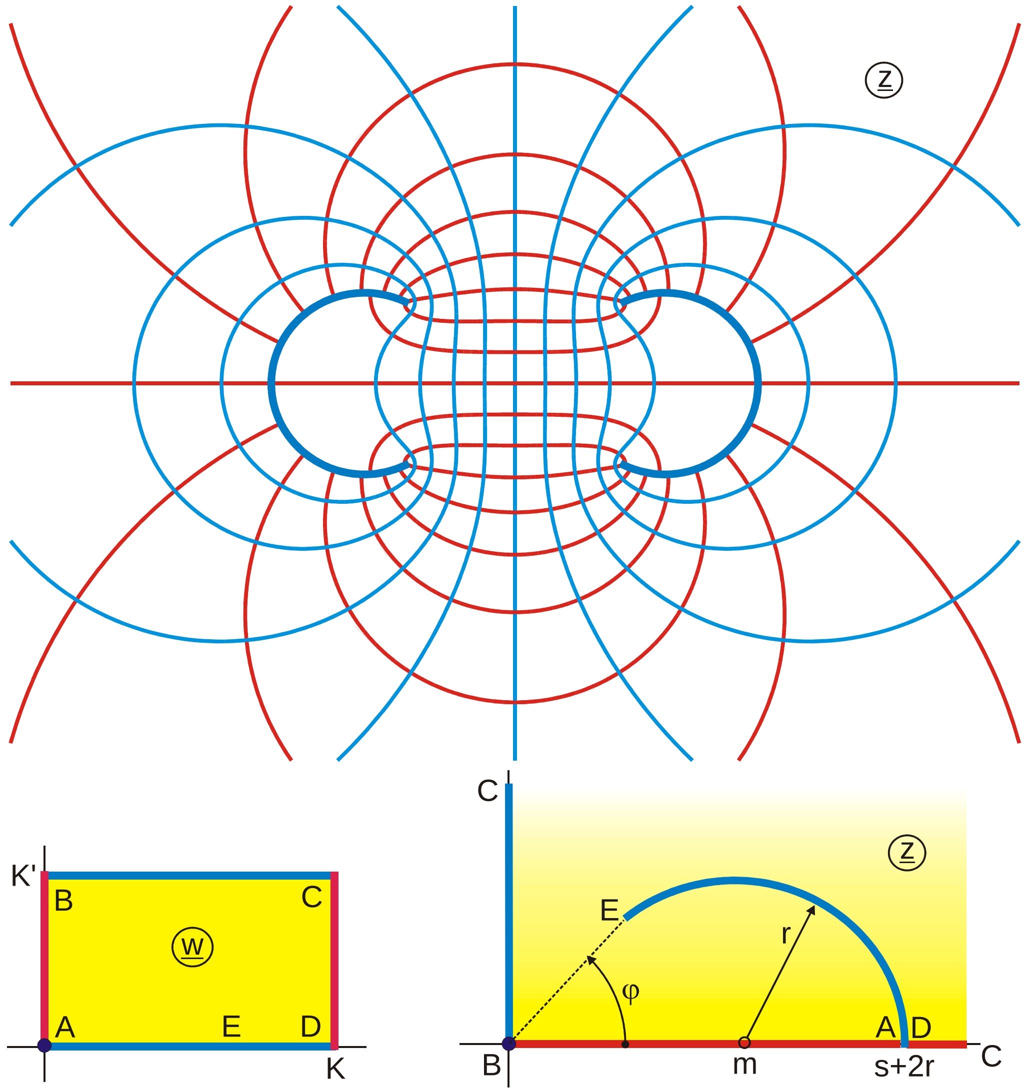


Abbildung E 4.2

$$z = \frac{1 + w_1}{1 - w_1}$$

gegeben: s,k

$$w_1 = q \frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w + ja), \tau\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w - ja), \tau\right]}$$

$$q = \frac{1 - s}{1 + s}$$

$$\tau = \frac{K'(k)}{K(k)}$$

$$a = -\frac{K(k)}{\pi} \ln q$$

m = (s + 1/s)/2

r = (1/s-s)/2

$$\sigma = \frac{Z_e(ja, k)}{k^2\, sn(ja)\left[cn(ja)\, dn(ja) + sn(ja)\, Z_e(ja)\right]}$$

$$\varphi = \arg \frac{1 - q \exp(-j\alpha)}{1 + q \exp(-j\alpha)}$$

$$\alpha = 2 \arg \vartheta_4\left[\frac{\pi}{2K(k)}(u_E + ja), \tau\right]$$

$$u_E = F_a\left(\sqrt{\sigma}, k\right)$$

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

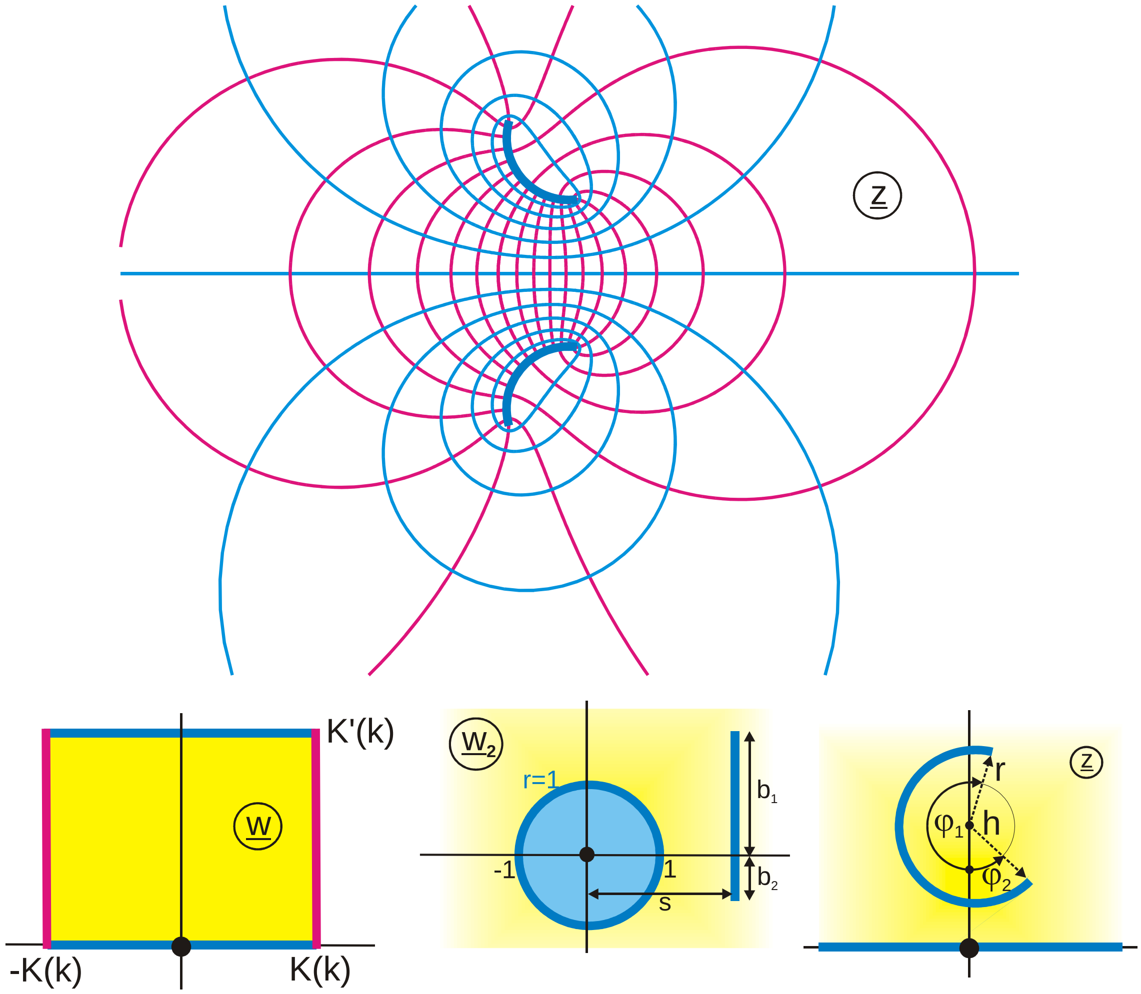


Abbildung E 4.3

$$z = -j\frac{1+w_2}{1-w_2}$$

$$w_2 = \frac{1}{\rho w_1} + r \qquad w_1 = r\left\{1+\exp(j\beta)\frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w+ja),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w-ja),\tau\right]}\right\}$$

$$r = s-\sqrt{s^2-1} \qquad \sigma = \frac{Z(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja)+\mathrm{sn}(ja)Z(ja,k)\right]}$$

$$a = -\ln r\,\frac{K(k)}{\pi} \qquad \rho = \frac{1}{1-r^2} \qquad u_E = -F_a\left(\sqrt{\sigma},k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K(k)}(-u_E+ja),\tau\right] \qquad 0 < a < K'(k) \qquad \tau = \frac{K'(k)}{K(k)}$$

$$b_1 = \frac{1}{\rho}\mathrm{Im}\left\{\frac{1}{r+r\exp(-j[\varphi-\beta])}\right\} \qquad b_2 = \frac{1}{\rho}\mathrm{Im}\left\{\frac{1}{r+r\exp(-j[\varphi+\beta])}\right\}$$

gegeben: s, β, k $\qquad -K(k) \le u \le 0 \qquad 0 \le v \le K'(k)$

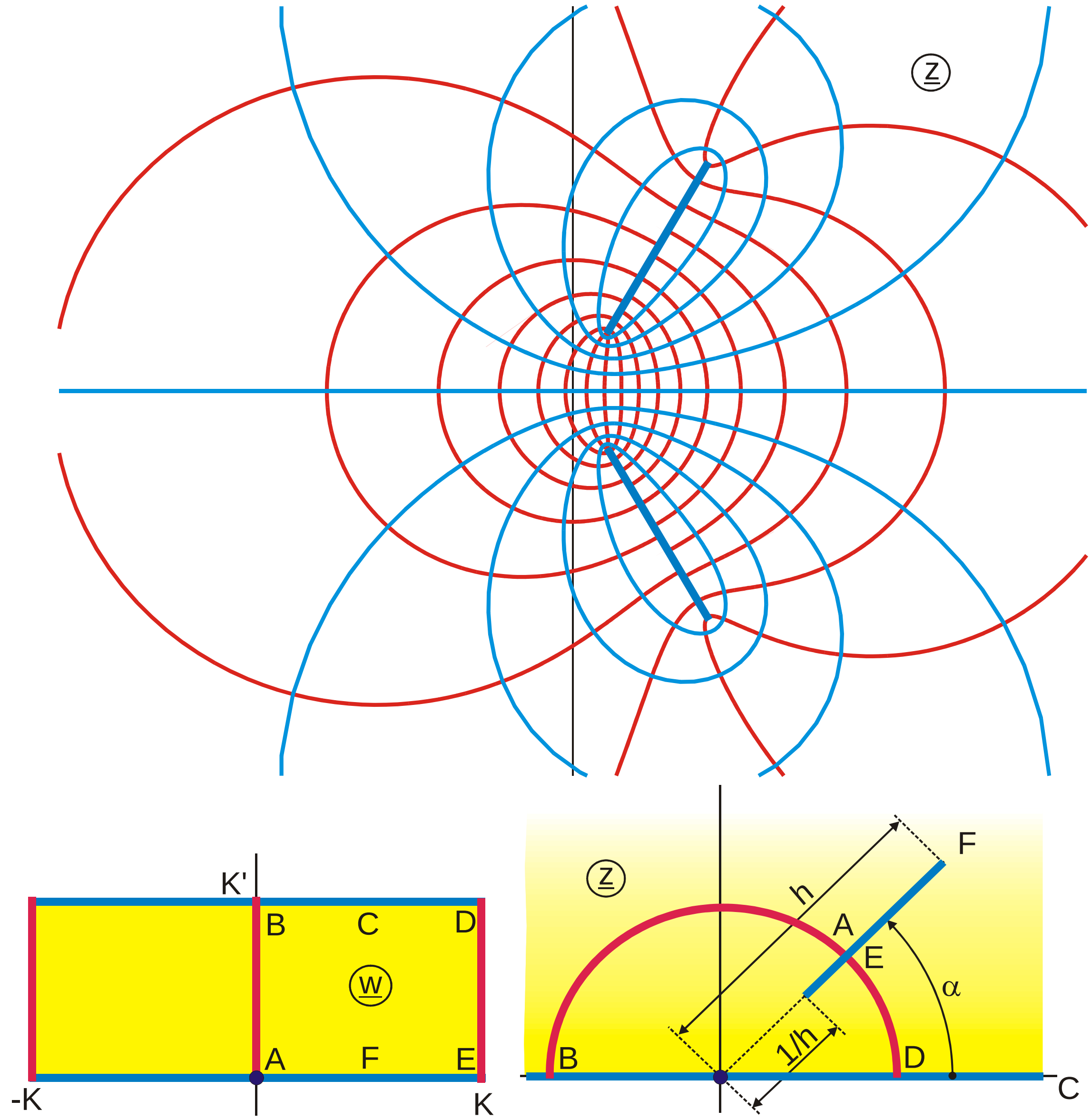


Abbildung E 5

$$z = \frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w+a),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w-a),\tau\right]} e^{j\alpha} \qquad h = \frac{\operatorname{Re}\vartheta_4\left[\frac{\pi}{2K(k)}(u_F+a),\tau\right]}{\operatorname{Re}\vartheta_4\left[\frac{\pi}{2K(k)}(u_F-a),\tau\right]}$$

$$\sigma = \frac{Z_e(a,k)}{k^2\,\mathrm{sn}(a,k)\left[\mathrm{cn}(a,k)\,\mathrm{dn}(a,k) + \mathrm{sn}(a,k)\,Z_e(a,k)\right]} \qquad a = \frac{\alpha\,K(k)}{\pi}$$

$$\tau = \frac{K(k)}{K'(k)} \qquad u_F = F_a\left(\sqrt{\sigma},k\right)$$

$-K(k) \le u \le K(k)$ $\quad 0 \le v \le K'(k)$ $\quad u_C = a$

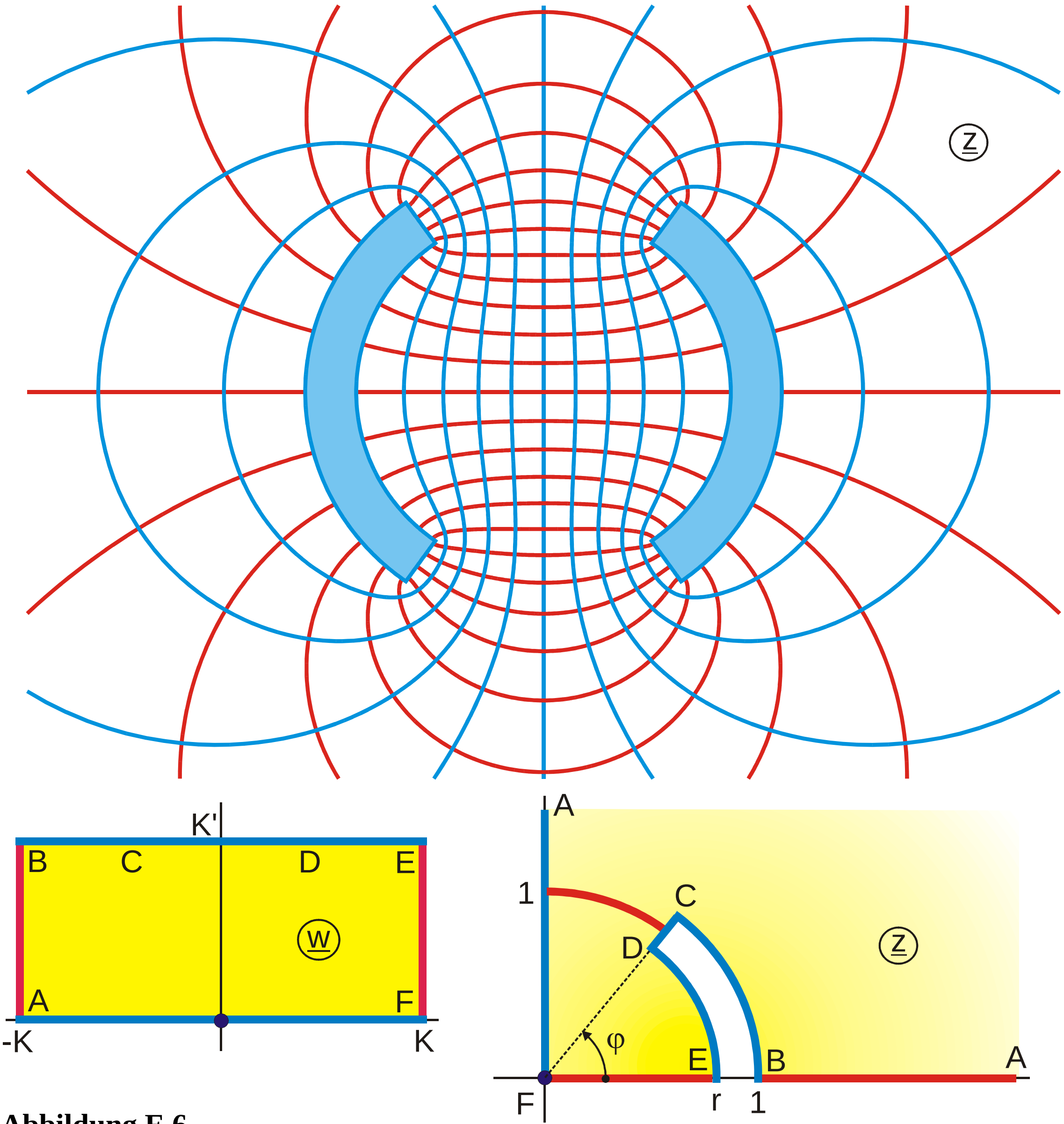


Abbildung E 6

$z = \frac{1}{\rho} \exp w_3$

gegeben: d, τ

$w_3 = \Pi_j(w_2, k_1, a)$

$w_2 = K(k_1) + jK'(k_1) - F_a(w_1, k_1)$

$w_1 = k\,\mathrm{sn}(w, k)$

$k_1 = \{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\}^2$

$a = (1\text{-}d)K(k_1)$

$\tau = K'(k_1)/K(k_1)$

$-K(k) \le u \le K(k)$

$0 \le v \le K'(k)$

$k = \mathrm{sn}\,[d\,K(k_1), k_1]$

$g = K(k_1)\,Z_e(a, k_1)$

$u_D = -u_C = \mathrm{Re}\,F_a\left(\frac{1}{k\,k_1}, k\right)$

$f = \frac{\pi}{2} - K'(k_1)\,Z_e(a, k_1) - \frac{\pi a}{2K(k_1)}$

$\rho = \exp g$

$r = \exp(-2g)$

$\varphi = f\,180/\pi$

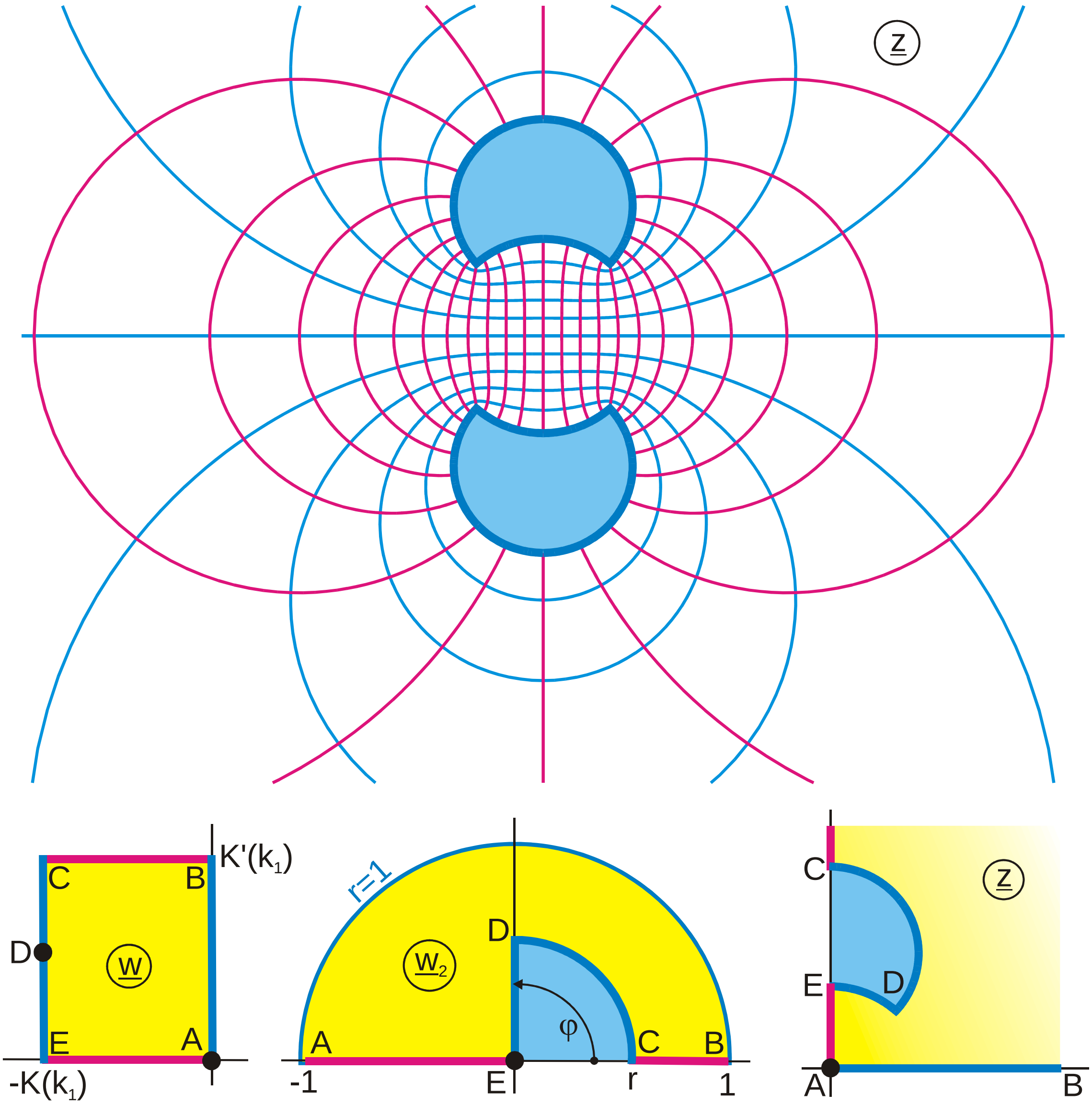


Abbildung E 6.1

$z = j\left(\dfrac{1}{w_5} + 0.5\right)$ $\qquad w_5 = \exp(w_4)$ $\qquad w_4 = \dfrac{\pi}{b_1}\left(w_3 - h\right)$ $\qquad w_3 = \Pi_e\left(w_2, k, a\right)$

$w_2 = K(k) + jK'(k) - F_a\left(w_1, k\right)$ $\qquad w_1 = \dfrac{k_1}{k}\operatorname{sn}(w, k_1)$

gegeben : $\tau = K'(k)/K(k)$, d $\qquad h = K(k)\{1 + b\, Z_e(a,k)\}$

$b_1 = b\left\{K'(k)\, Z_e(a,k) + \dfrac{\pi a}{2K(k)}\right\} + K'(k)$ $\qquad v_D = \operatorname{Im} F_a\left(\dfrac{k}{k_1}, k_1\right)$

$b_2 = b\left\{K'(k)\, Z_e(a,k) + \dfrac{\pi a}{2K(k)} - \dfrac{\pi}{2}\right\} + K'(k)$ $\qquad r = \exp\dfrac{-h\pi}{b_1}$

$a = (1-d)\, K(k)$ $\qquad k = \{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\}^2$

$k_1 = k \operatorname{sn}\{d\ K(k), k\}$ $\qquad \tau = 2{,}2;\ d = 0{,}3505$ $\qquad b = \dfrac{\operatorname{sn}(a,k)}{\operatorname{cn}(a,k)\operatorname{dn}(a,k)}$

$-K(k_1) \le u \le 0$ $\qquad \varphi = \pi\dfrac{b_2}{b_1}$ $\qquad 0 \le v \le K'(k_1)$

Abbildungen Gruppe F

Zwei leitende Elektroden endlicher Ausdehnung, entgegengesetzt gleich große Ladung

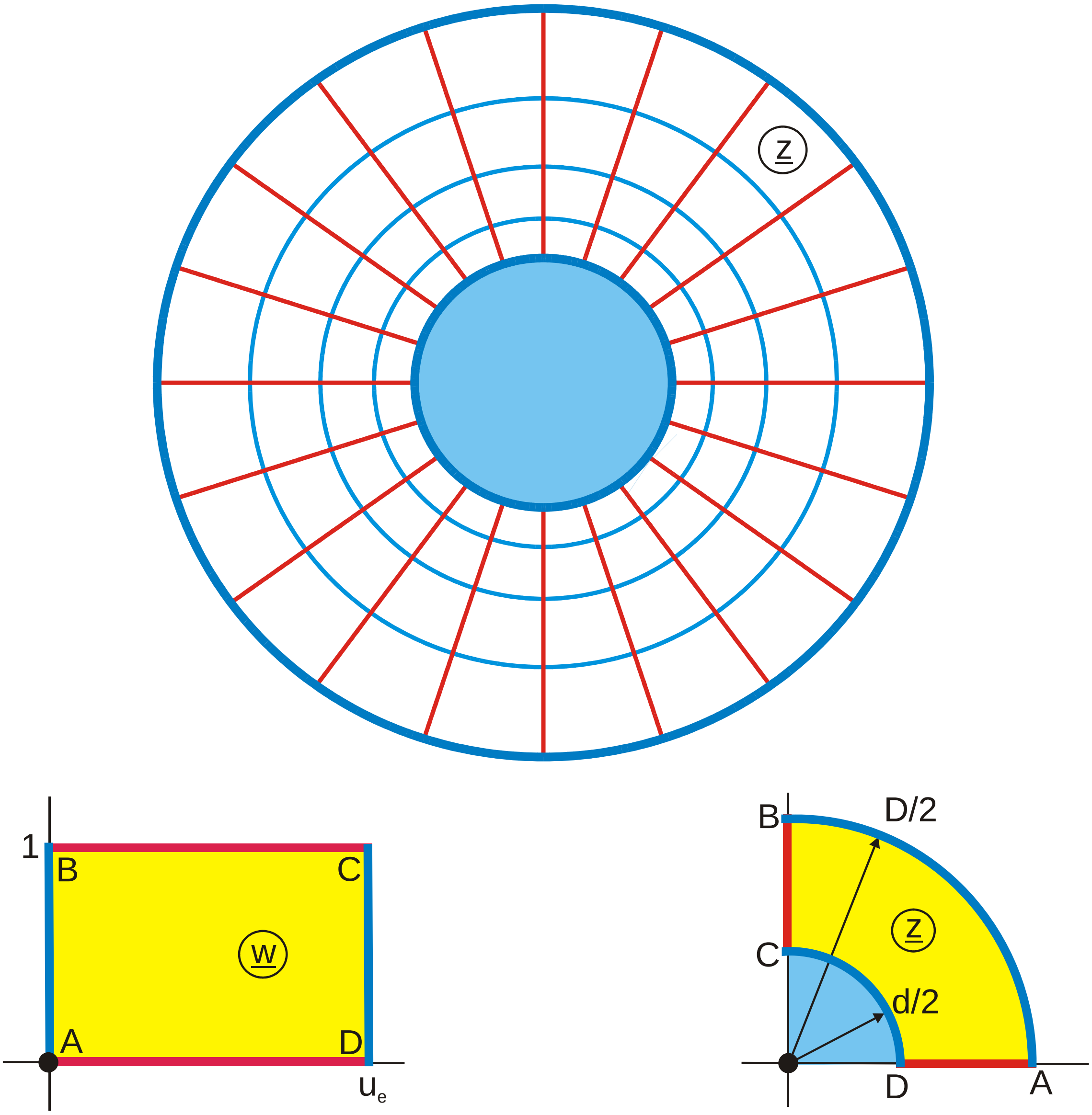


Abbildung F 1

$$z = \exp(w\pi)$$

$$u_e = \frac{1}{\pi} \ln \frac{d}{D}$$

$0 \leq u \leq u_e$

$0 \leq v \leq 0{,}5$

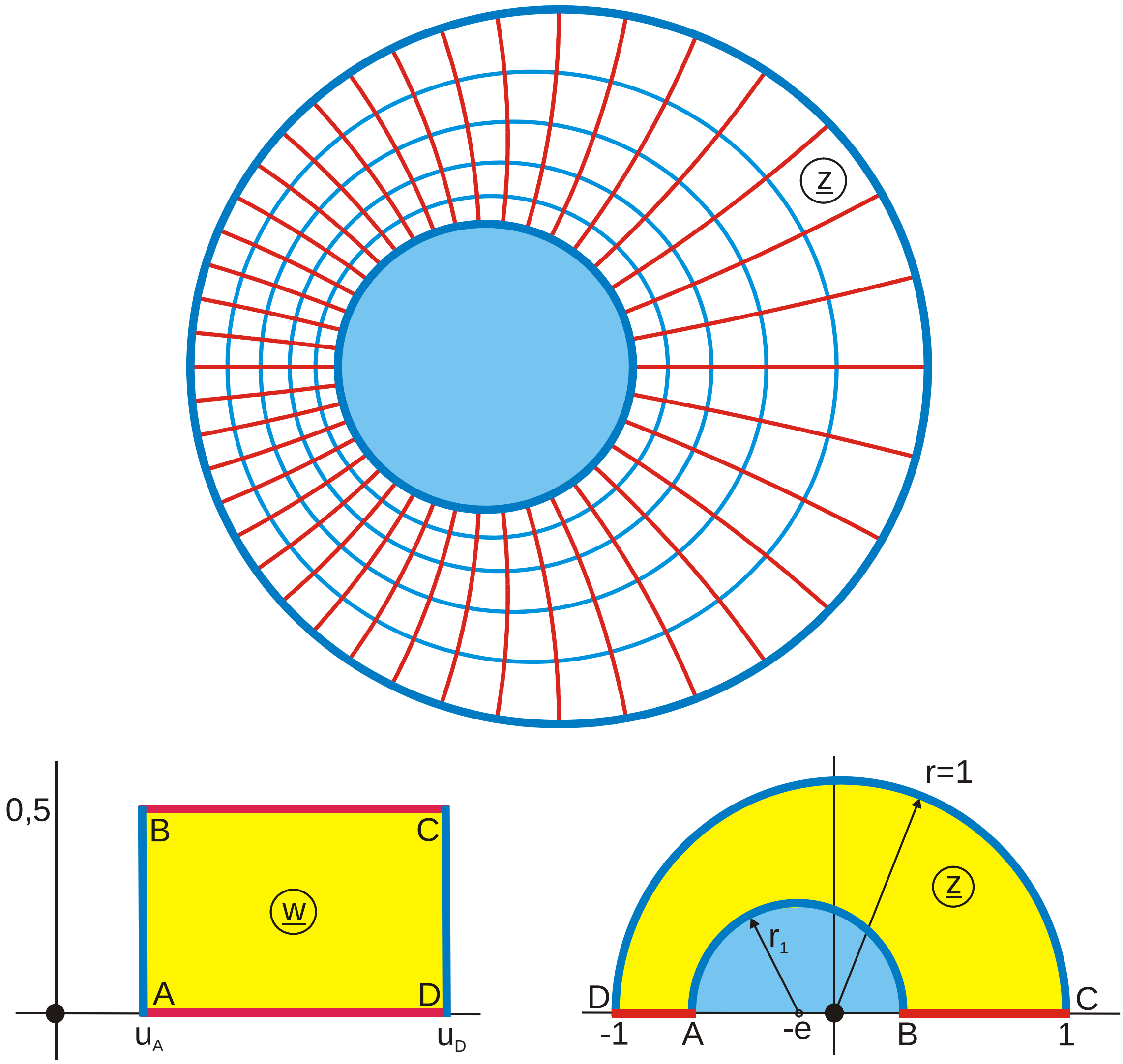


Abbildung F 1.1 bzw X 29

$$z = a\tanh(w\pi) - \sqrt{a^2+1}$$

$$a = \frac{1}{e}\sqrt{\frac{\left(r_1^2+1-e^2\right)^2}{4} - r_1^2}$$

gegeben: r_1, e

$$u_A = \frac{1}{2\pi}\operatorname{ar\,sinh} a \qquad u_D = \frac{1}{2\pi}\operatorname{ar\,sinh}\frac{a}{r_1}$$

$u_A \le u \le u_D$

$0 \le v \le 0{,}5$

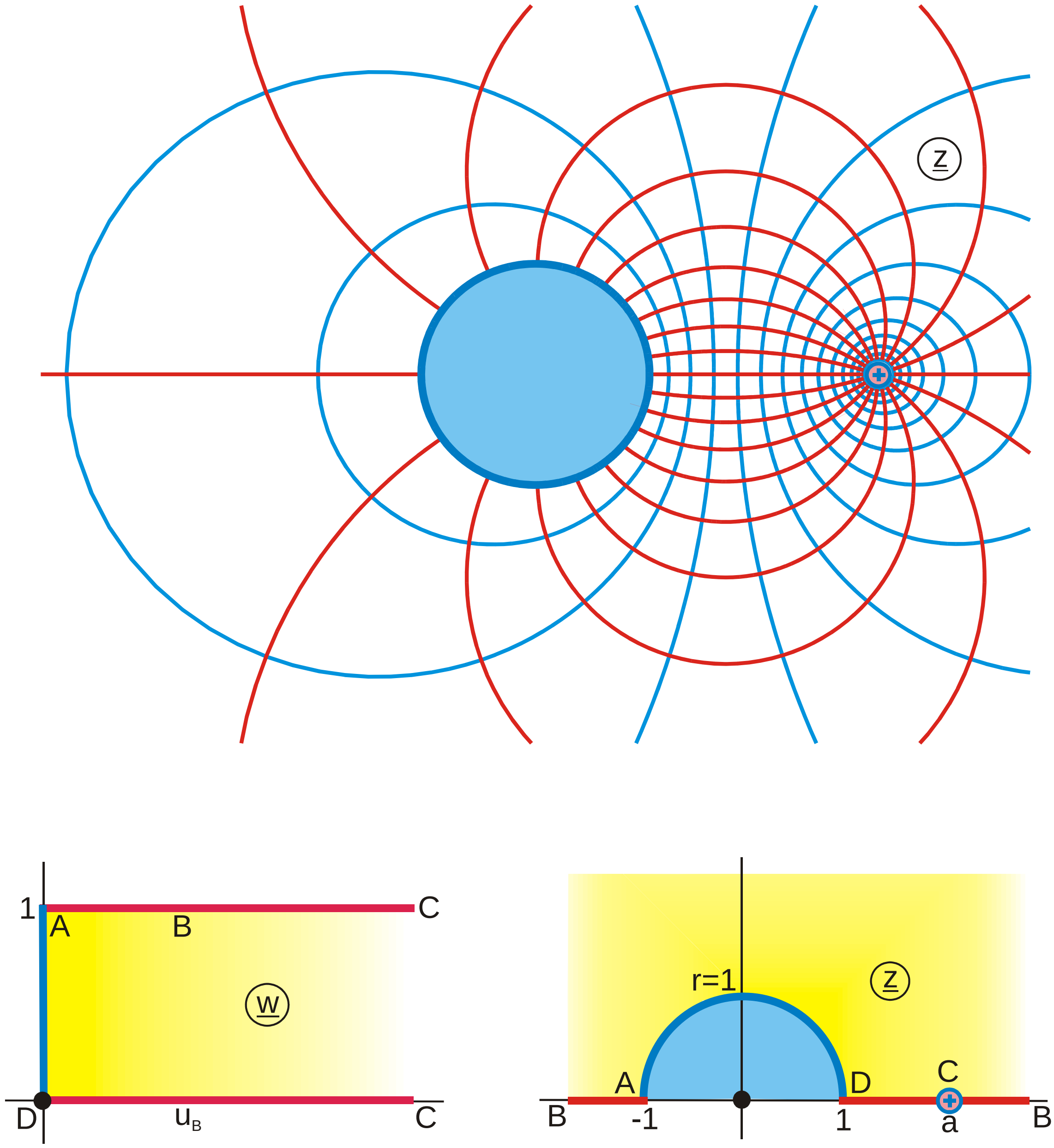
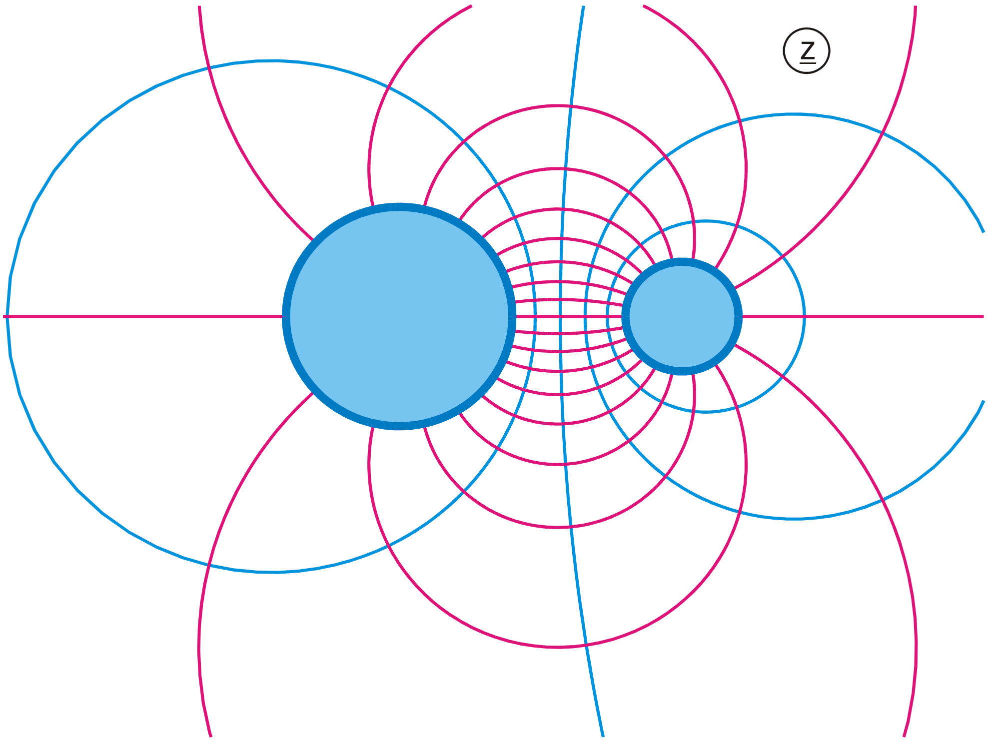


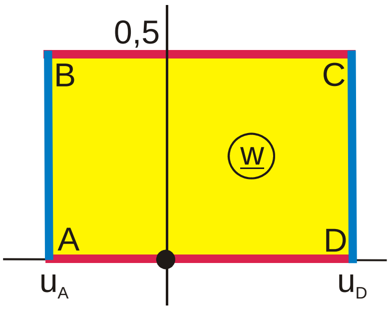
Abbildung F 1.2

$$z = \frac{1 + aE}{a + E} \qquad E = \exp(w\pi)$$

$$u_B = \frac{1}{\pi} \ln a \qquad x_B = \frac{1}{2}\left(a + 1/a\right)$$

$0 \le u \le 1{,}3 \qquad 0 \le v \le 1$





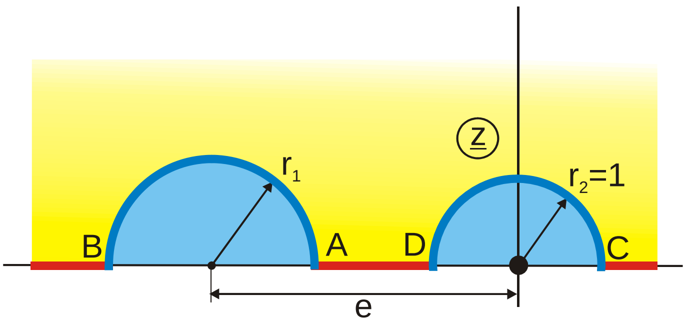


Abbildung F 1.3

$z = \left(a\tanh(w\pi) - d_2\right)/r_2$

$d_1 = \sqrt{a^2 + r_1^2}$

$u_A = -\frac{1}{2\pi}\operatorname{ar\,sinh}\sqrt{\left(\frac{d_1}{r_1}\right)^2 - 1}$

$a = \frac{1}{e}\sqrt{f^2 - r_1^2 r_2^2}$

$u_A \le u \le u_D$

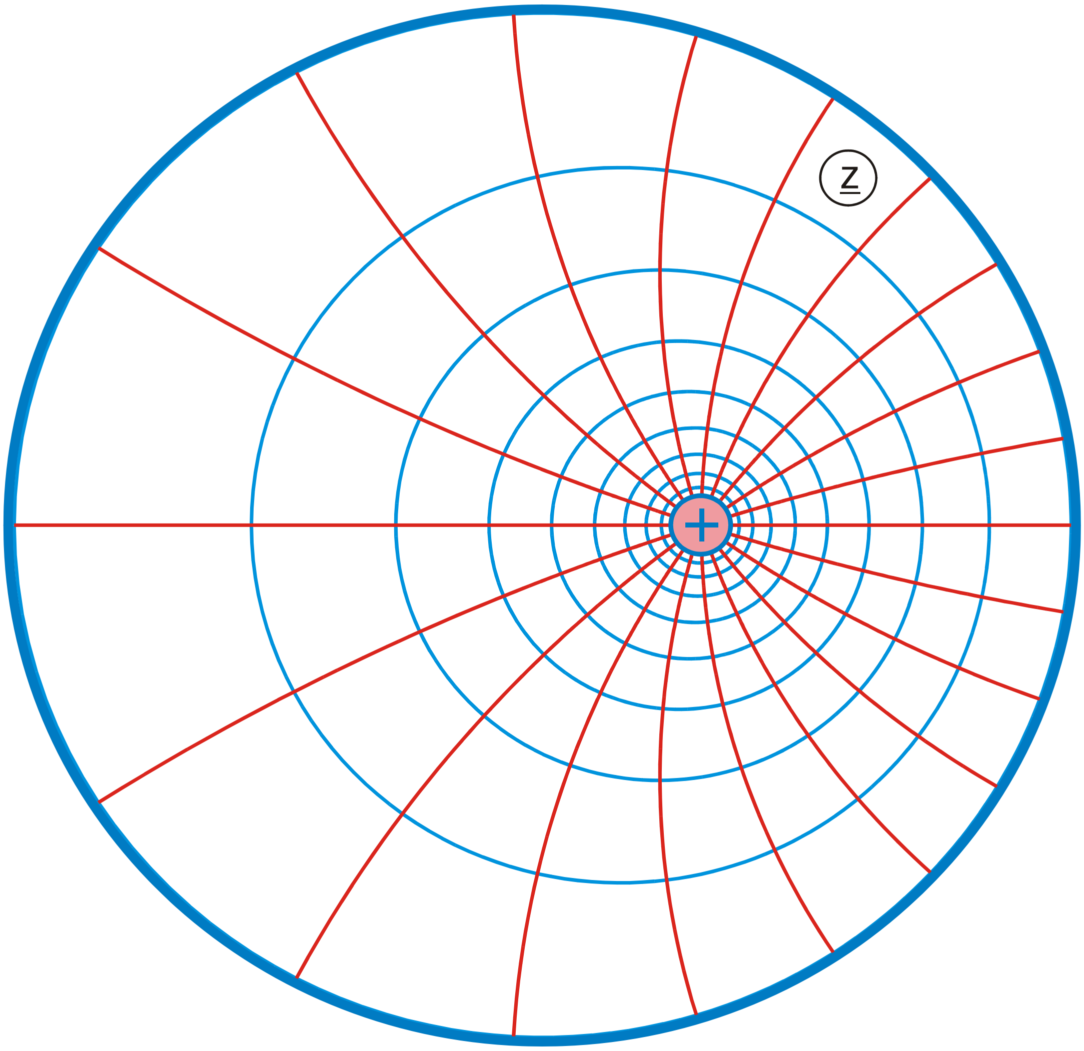
gegeben: r_1, r_2, $e > r_1 + r_2$

$d_2 = \sqrt{a^2 + r_2^2}$

$u_D = \frac{1}{2\pi}\operatorname{ar\,sinh}\sqrt{\left(\frac{d_2}{r_2}\right)^2 - 1}$

$f = \frac{1}{2}\left(r_1^2 + r_2^2 - e^2\right)$

$0 \le v \le 0{,}5$



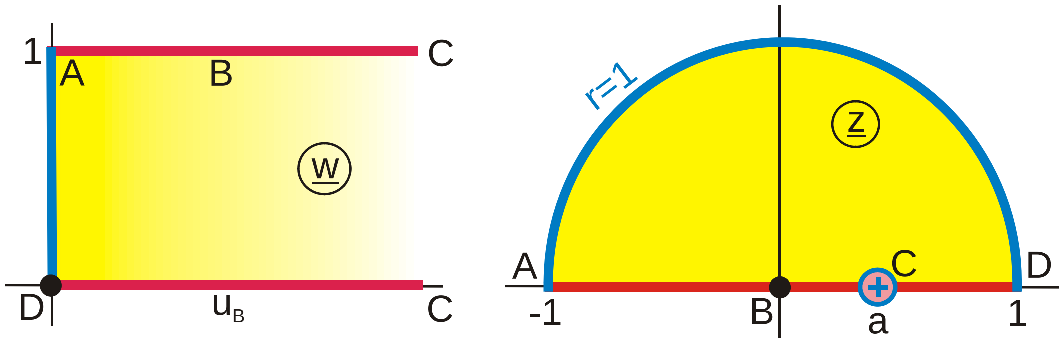
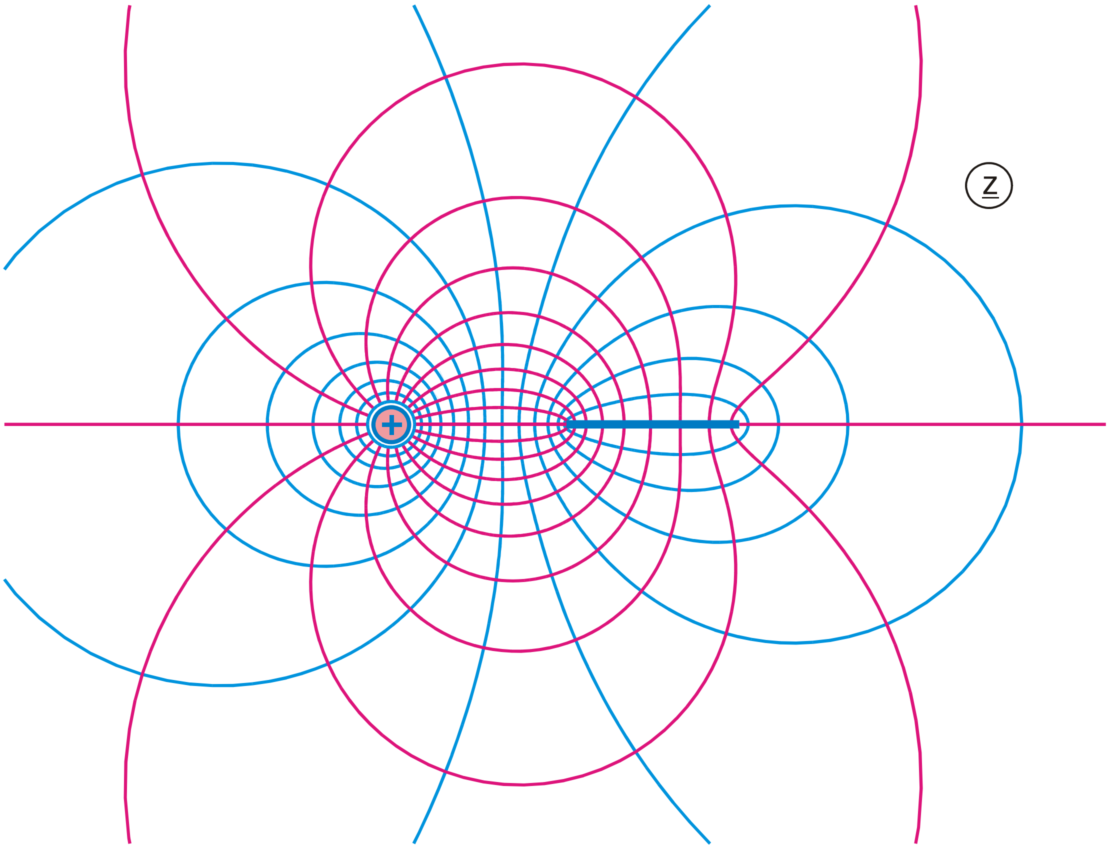


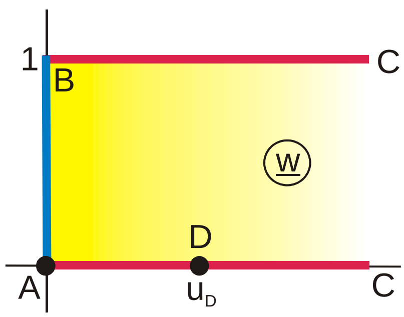
Abbildung F 1.4 (X 30)

$z = \dfrac{1 + aE}{a + E}$ $\qquad$ $E = \exp(w\pi)$

$u_B = \dfrac{1}{\pi}\ln a$ $\qquad$ Abb. F 1.2 mit a < 1

$0 \le u \le 1$ $\qquad$ $0 \le v \le 1$





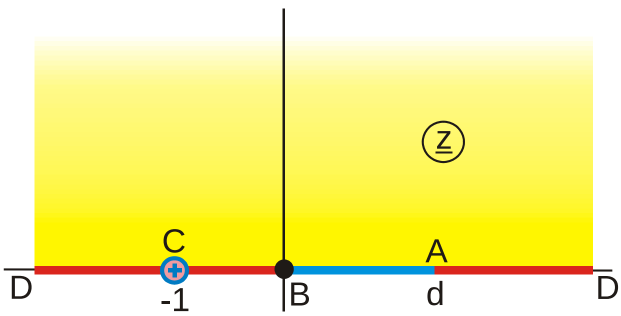


Abbildung F 2

$$z = \frac{1 + \cosh(w\pi)}{1 - \cosh(w\pi) + 2/d} \qquad u_D = \frac{1}{\pi} \operatorname{ar\,cosh}(1 + \frac{2}{d})$$

$0 \le u \le 1{,}3$ $\qquad$ $0 \le v \le 1$

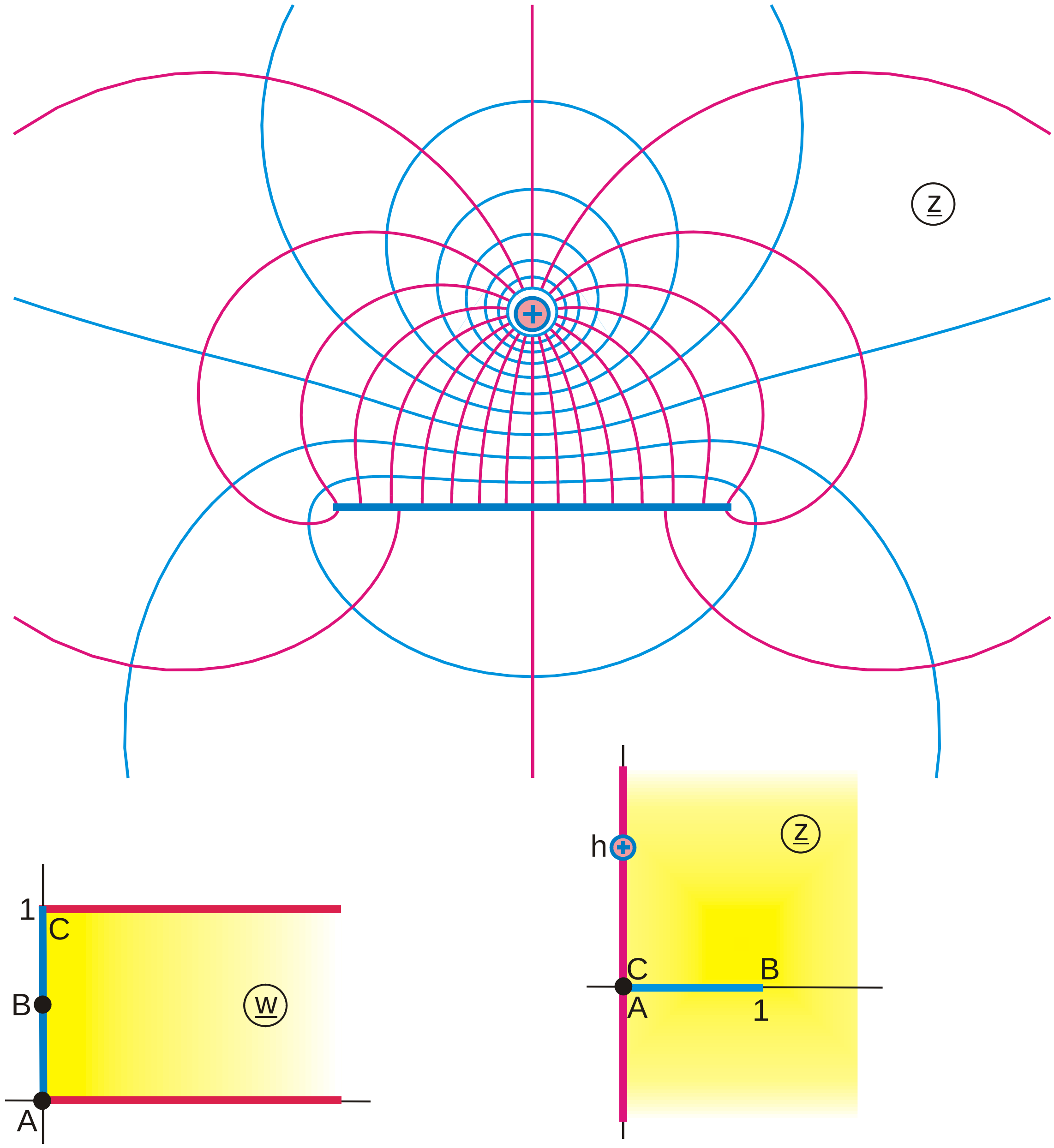


Abbildung F 2.1

$$z = -2\frac{w_1}{1+w_1^{\,2}} \qquad w_1 = ja\frac{1+\exp(w\pi)}{1-\exp(w\pi)}$$

$$h = \frac{2a}{1-a^2} \qquad a = \sqrt{1+\frac{1}{h^2}} - \frac{1}{h}$$

$$v_B = \frac{2}{\pi}\arctan a \qquad h = 1$$

$$0 \le u \le 1 \qquad 0 \le v \le 1$$

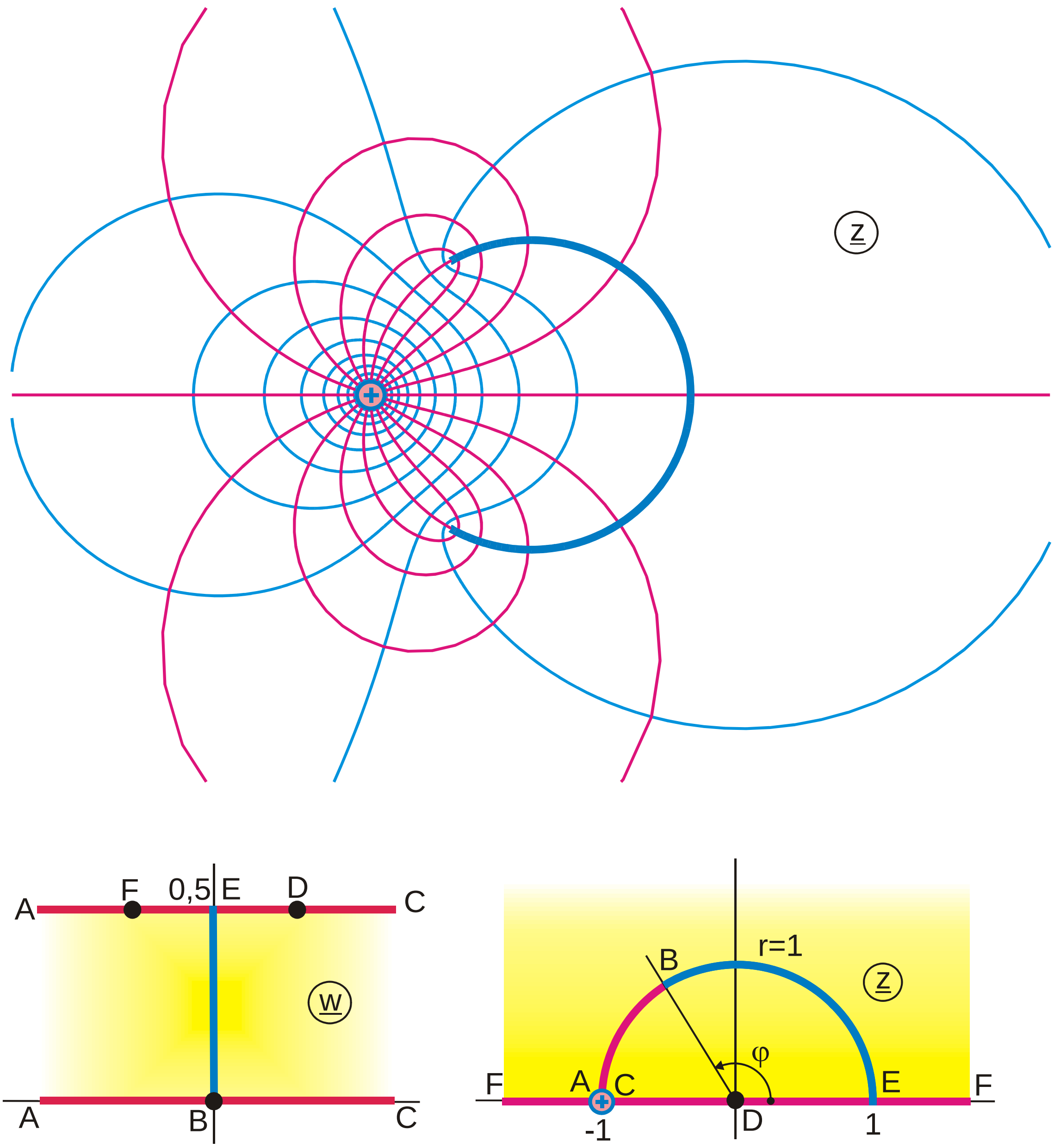


Abbildung F 2.2

$$z = \frac{1 + ja\cosh(w\pi)}{1 - ja\cosh(w\pi)}$$

$$\varphi = 2\arctan a$$

$$a = \tan\frac{\varphi}{2}$$

$$u_D = -u_F = \frac{1}{\pi}\operatorname{ar\,sinh}\frac{1}{a}$$

$-1 \leq u \leq 1$

$0 \leq v \leq 0{,}5$

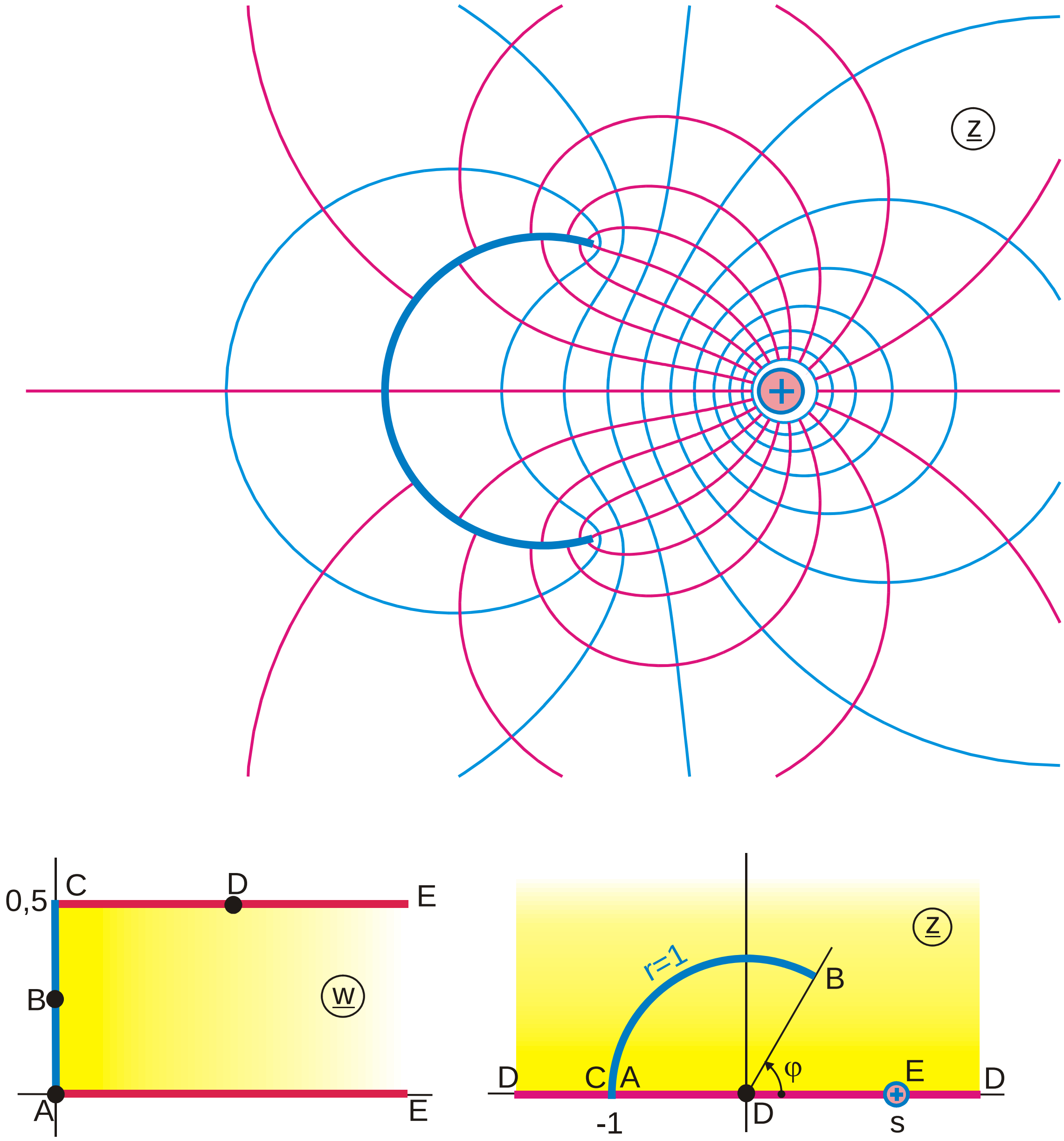


Abbildung F 2.3

$$z = \frac{w_3 + j}{w_3 - j}$$

$$w_3 = -2b\frac{w_2}{1 + {w_2}^2}$$

$$w_2 = ja / w_1$$

$$w_1 = -\tanh(w\pi)$$

$$a = b\frac{1-s}{1+s} + \sqrt{1 + \left(b\frac{1-s}{1+s}\right)^2}$$

$$b = 1/\tan(\varphi / 2)$$

$$0 \le u \le 0{,}5$$

$$u_D = -\frac{1}{\pi}\operatorname{artanh}\frac{a}{b + \sqrt{1 + b^2}}$$

$$0 \le v \le 0{,}5$$

$$v_B = \frac{1}{\pi}\arctan a$$

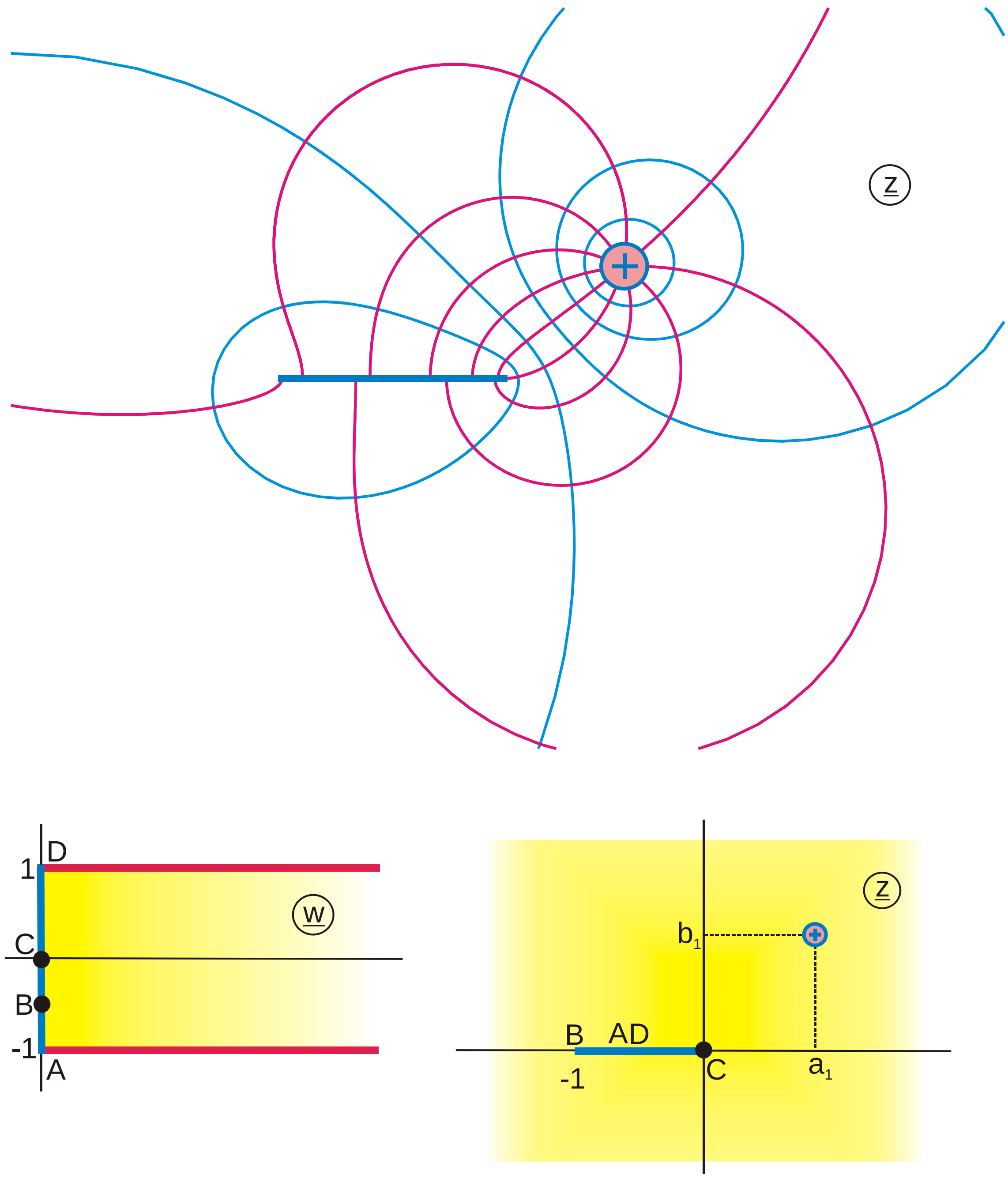
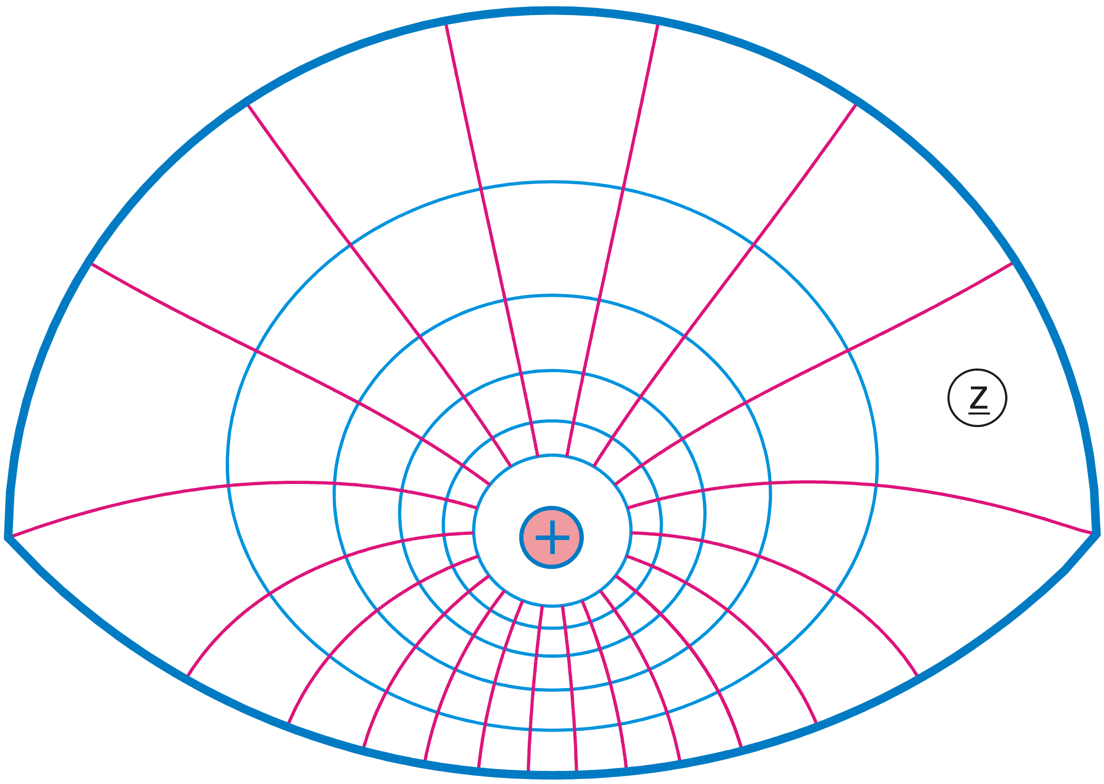


Abbildung F 2.4

$$z = \frac{1}{w_1^{\,2} - 1} \qquad w_1 = a\frac{1+\exp(w\pi)}{1-\exp(w\pi)} + jb$$

$$a + jb = 1 + \frac{1}{a_1 - jb_1} \qquad v_B = -\frac{2}{\pi}\arctan\frac{a}{b}$$

$0 \le u \le 1{,}2$ $\qquad$ $-1 \le v \le 1$



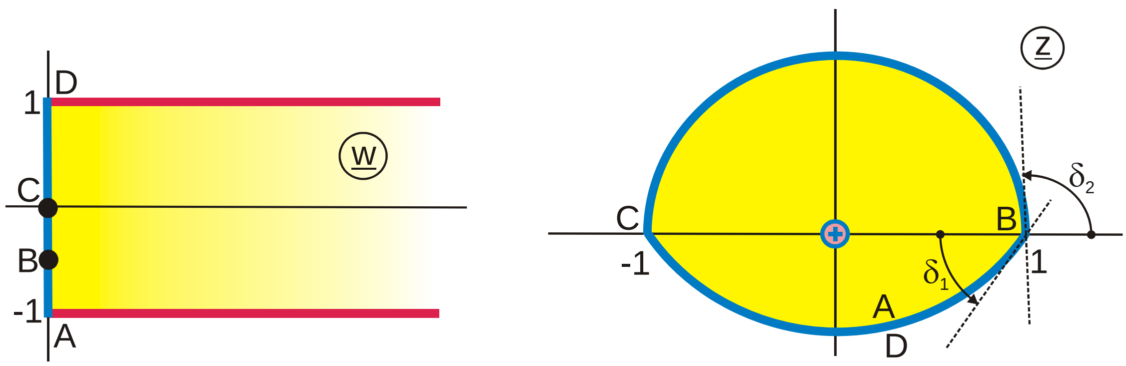


Abbildung F 2.5

$$z = \frac{1 + w_2}{1 - w_2}$$

$$w_2 = \exp(j\delta_2)\ w_1^{(1-\delta_2/\pi+\delta_1/\pi)}$$

$$w_1 = ja\frac{1 + \exp(w\pi)}{1 - \exp(w\pi)} + b$$

$$\delta_2 \geq \delta_1$$

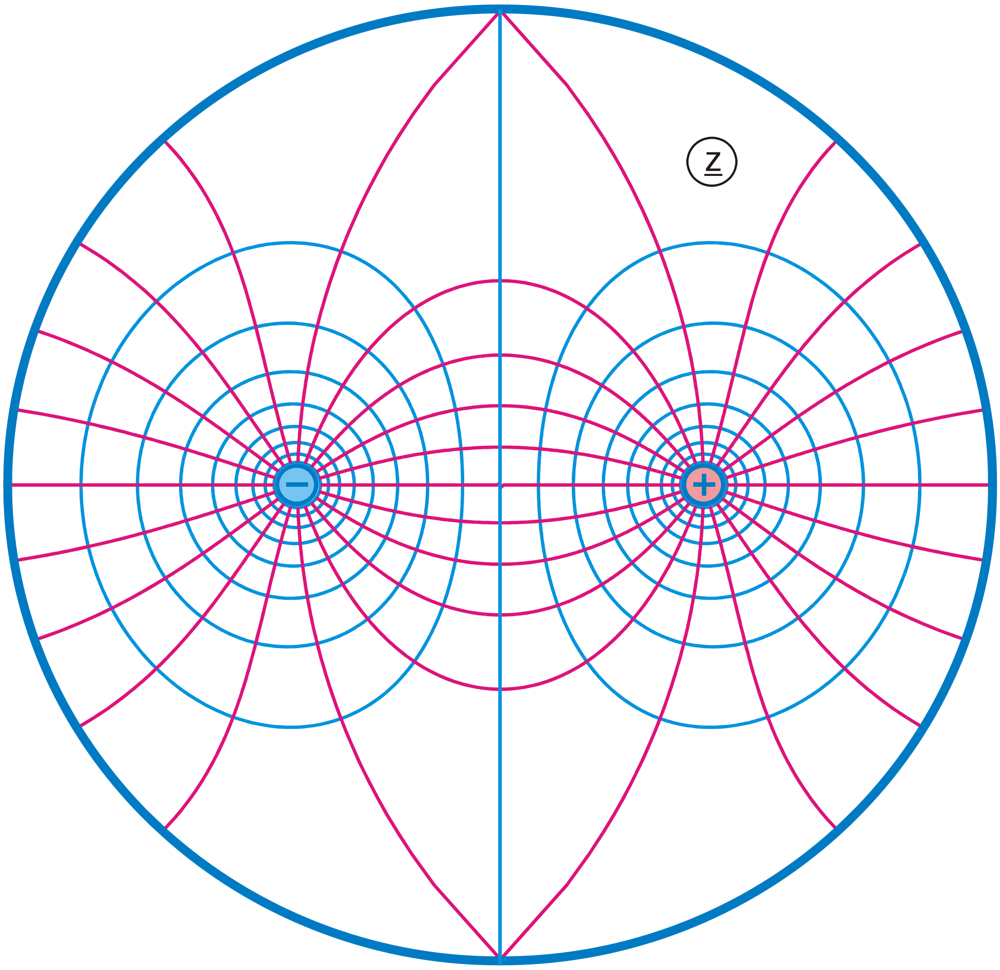
$$\varphi = \frac{\pi - \delta_2}{1 - \delta_2/\pi + \delta_1/\pi}$$

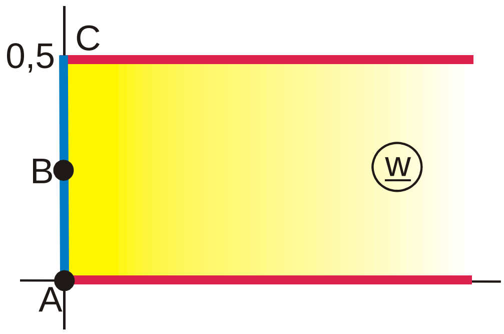
$$v_B = \frac{2}{\pi}\arctan\frac{a}{b}$$

$b = \cos\varphi$ $\quad$ $a = \sin\varphi$

$0 \leq u \leq 0{,}5$ $\quad$ $-1 \leq v \leq 1$

$\delta_1 = 48{,}5°$ $\quad$ $\delta_2 = 90°$





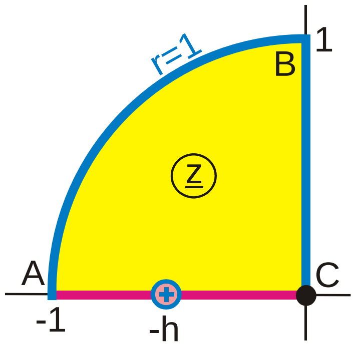


Abbildung F 2.6

$z = -w_1 - \sqrt{w_1^2 + 1}$

$a = \frac{1}{2}\left(h + \frac{1}{h}\right)$

$0 \le u \le 0{,}4$

$w_1 = a \tanh(w\pi)$

$v_B = \frac{1}{\pi} \arctan \frac{1}{a}$

$0 \le v \le 0{,}5$

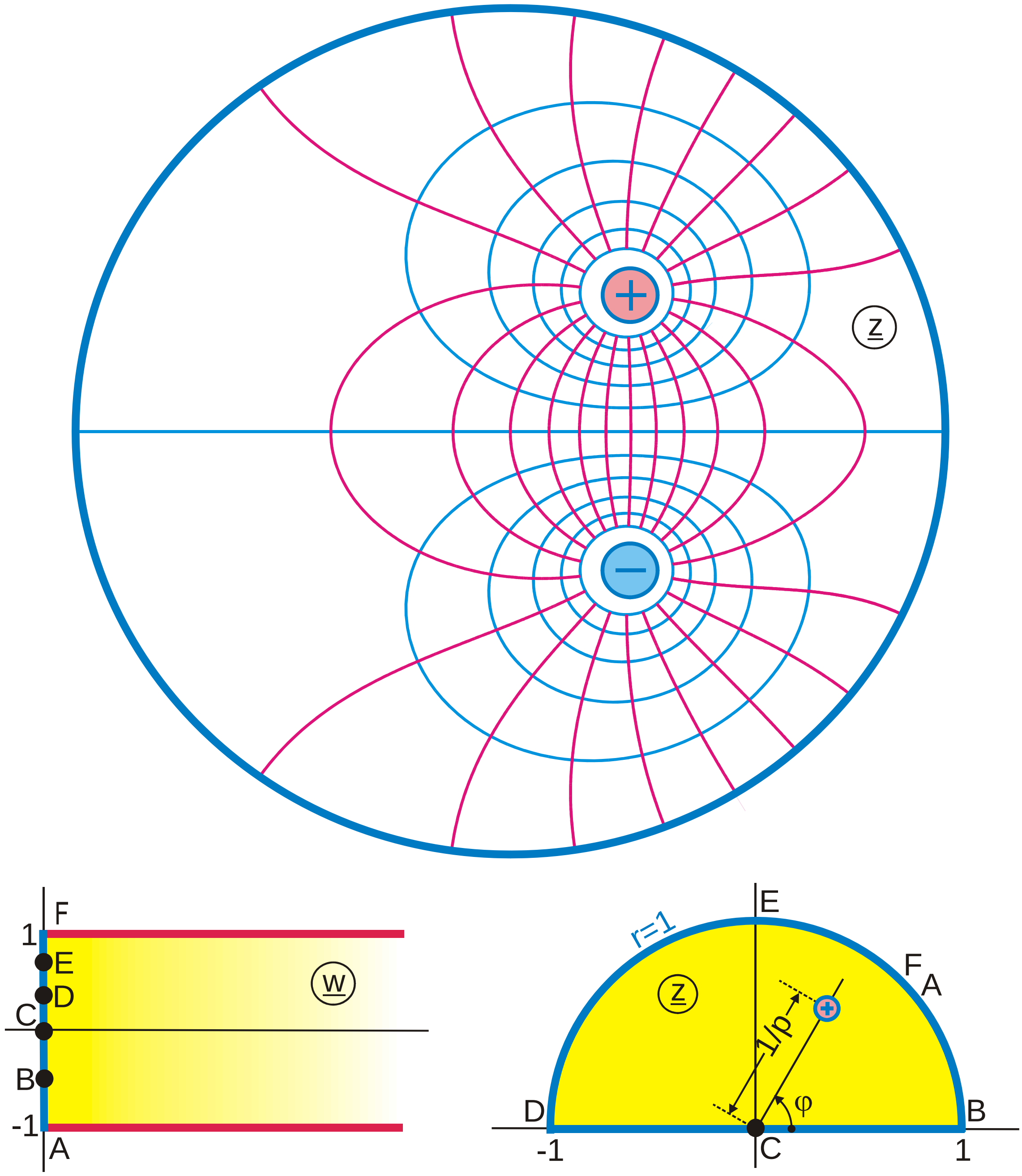


Abbildung F 2.7

$$z=\sqrt{d^2-1}-d \qquad d=\frac{b}{2a}$$

$$b=e^{j\varphi}\left[\frac{\exp(w\pi)}{p}-p\right]+e^{-j\varphi}\left[p\exp(w\pi)-\frac{1}{p}\right] \qquad a=1-\exp(w\pi)$$

$$v_B=\frac{1}{\pi}\operatorname{Im}\ln\frac{1+\left(pe^{j\varphi}\right)^2-2pe^{j\varphi}}{p^2+e^{j2\varphi}-2pe^{j\varphi}} \qquad v_E=\frac{1}{\pi}\operatorname{Im}\ln\frac{1+\left(pe^{j\varphi}\right)^2}{p^2+e^{j2\varphi}}$$

$$v_D=\frac{1}{\pi}\operatorname{Im}\ln\frac{1+\left(pe^{j\varphi}\right)^2+2pe^{j\varphi}}{p^2+e^{j2\varphi}+2pe^{j\varphi}} \qquad 0\le u\le 0{,}5 \qquad -1\le v\le 1$$

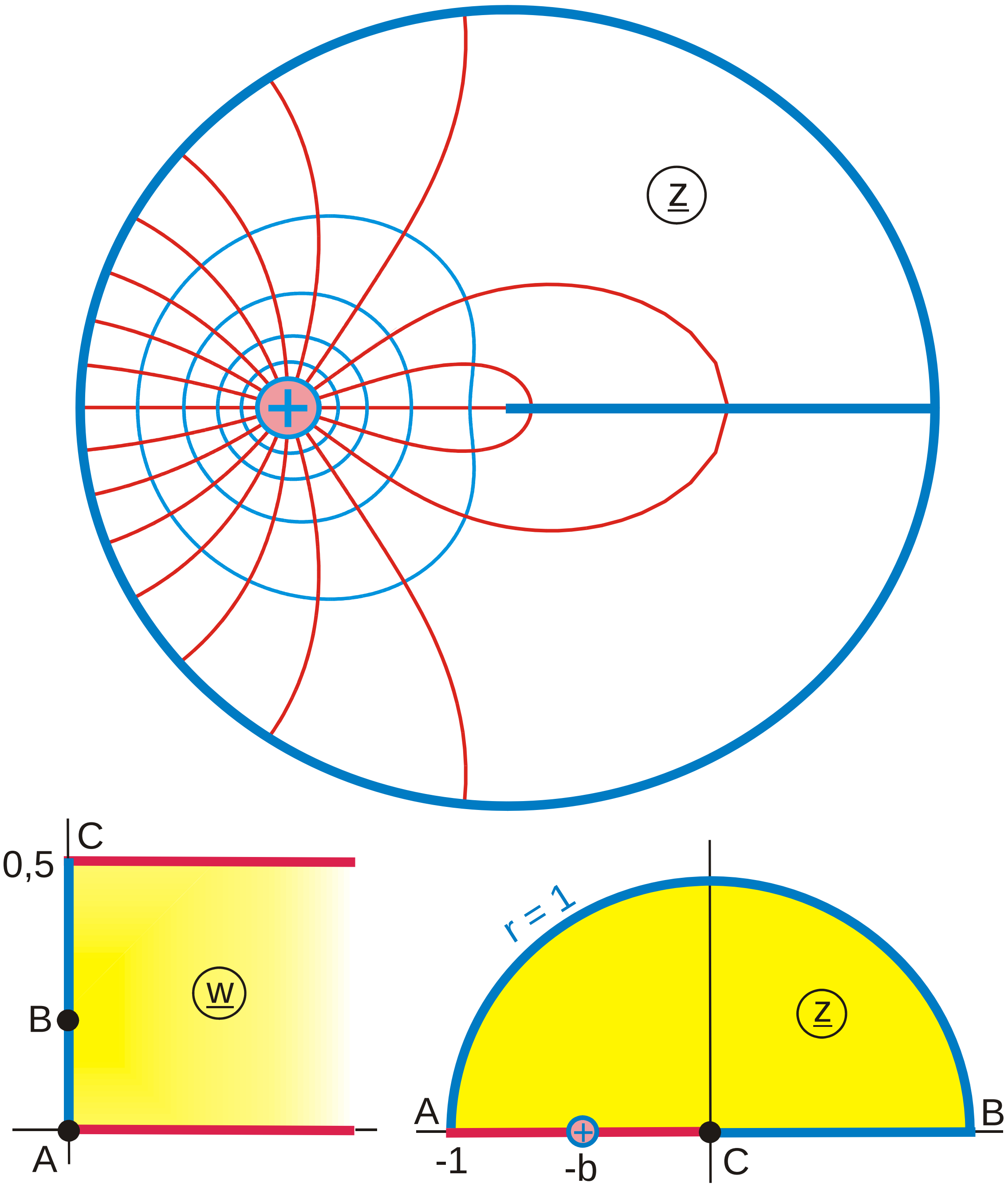


Abbildung F2.8

$z = -w_2^{\,2}$

$w_1 = a \tanh(w\pi)$

$a = \dfrac{b-1}{2\sqrt{b}}$

$0 \le u \le 0{,}5$

$w_2 = w_1 + \sqrt{w_1^{\,2} + 1}$

$b = 0{,}51067$

$v_B = \dfrac{1}{\pi} \arctan \dfrac{1}{a}$

$0 \le v \le 0{,}5$

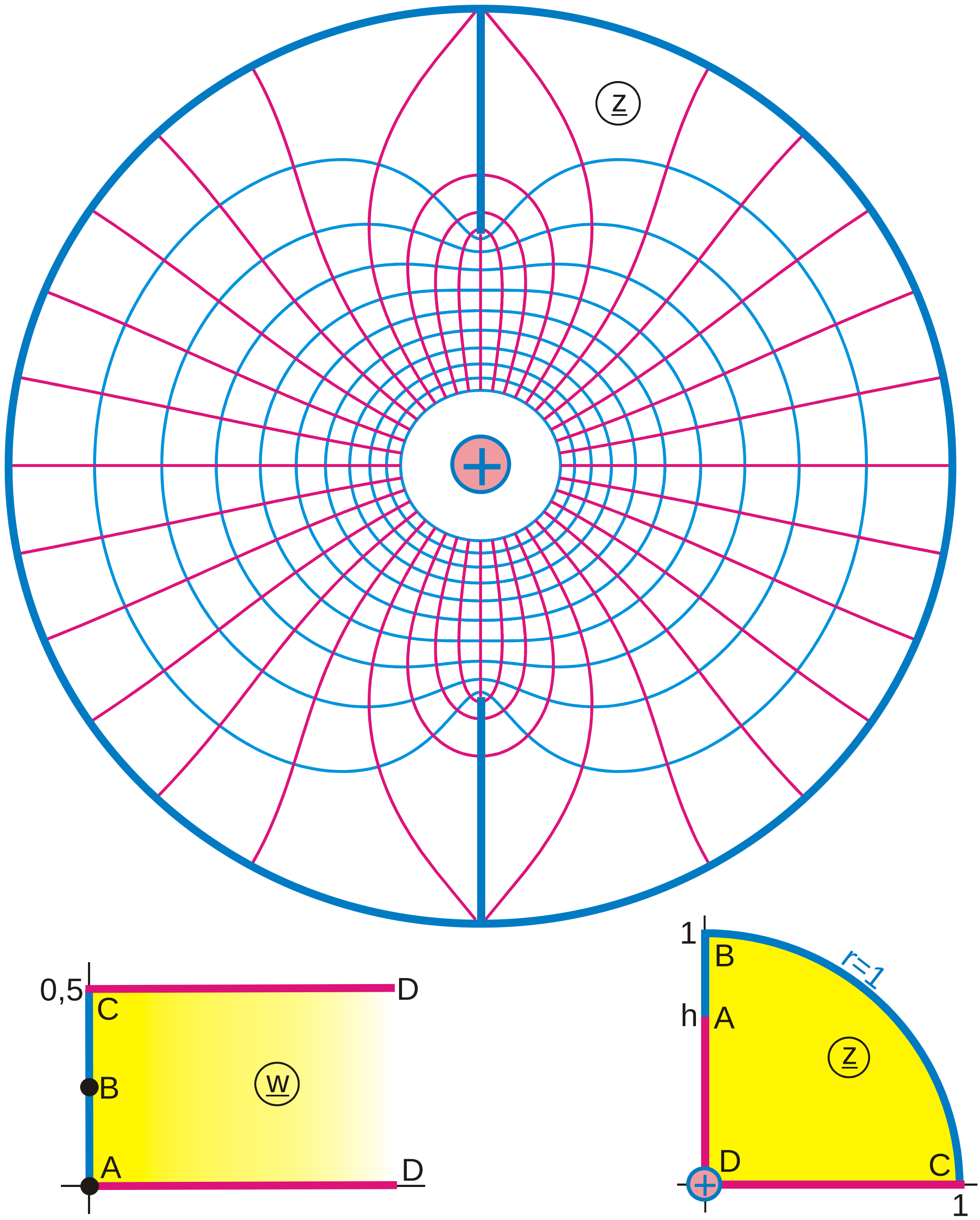


Abbildung F 2.9

$z = jw_1 + \sqrt{1 - w_1^{\;2}}$

$a > 0{,}5 : h = 1$ für $a = 0{,}5$

$w_1 = a\,(w_0 + 1/w_0)$

$w_0 = \exp(w\pi)$

$0 \le u \le 0{,}5$

$0 \le v \le 0{,}5$

$v_B = \dfrac{1}{\pi}\arccos\left(\dfrac{1}{2a}\right)$

$h = 1\Big/\left(2a + \sqrt{4a^2 - 1}\right)$

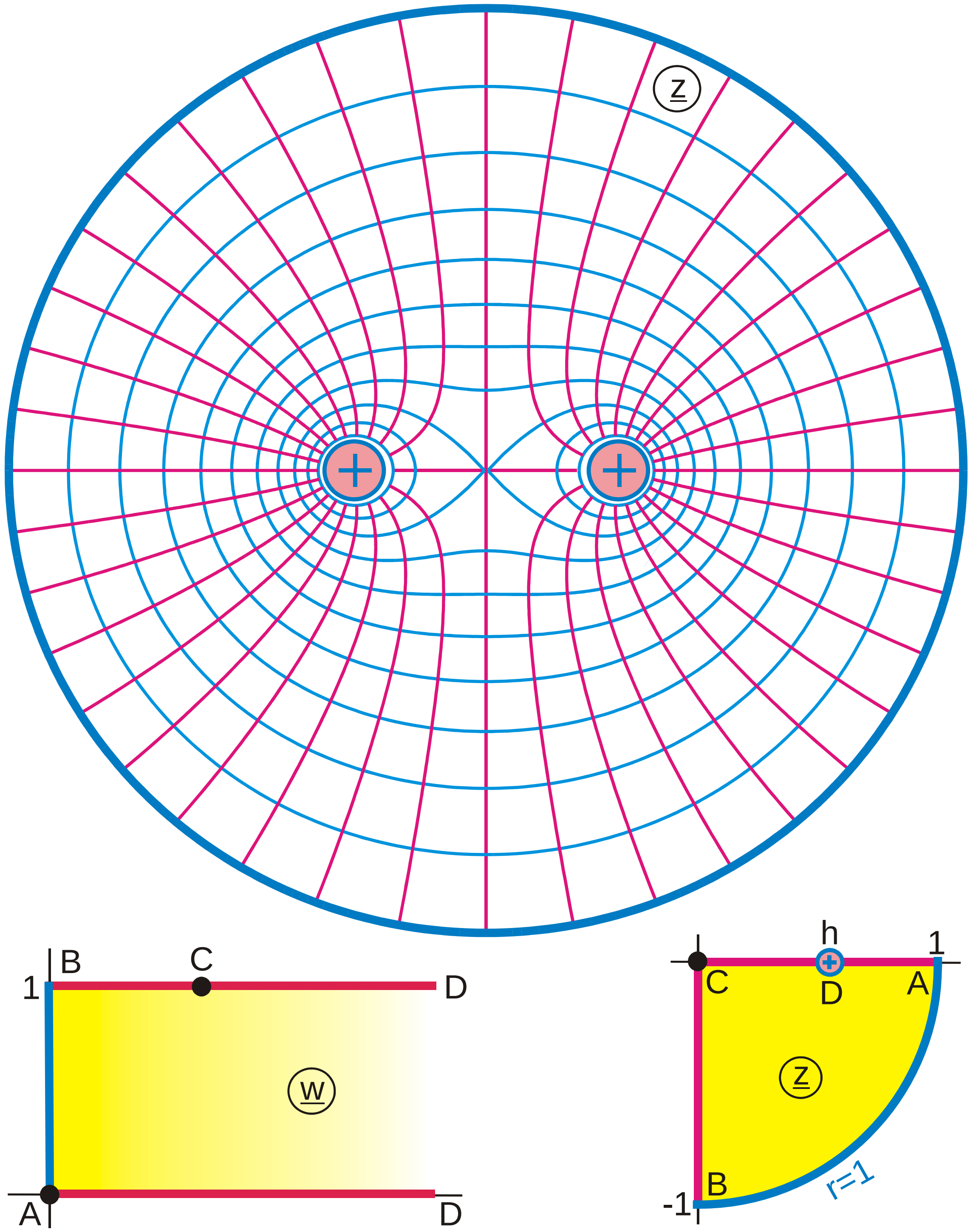


Abbildung F 2.10

$$z = \sqrt{\frac{1+\sigma w_1}{\sigma + w_1}}$$

$$w_1 = \exp(\pi w)$$

$\sigma = h^2$

$$u_C = \frac{1}{\pi} \ln \frac{1}{\sigma}$$

$0 \le u \le 1$

$0 \le v \le 1$

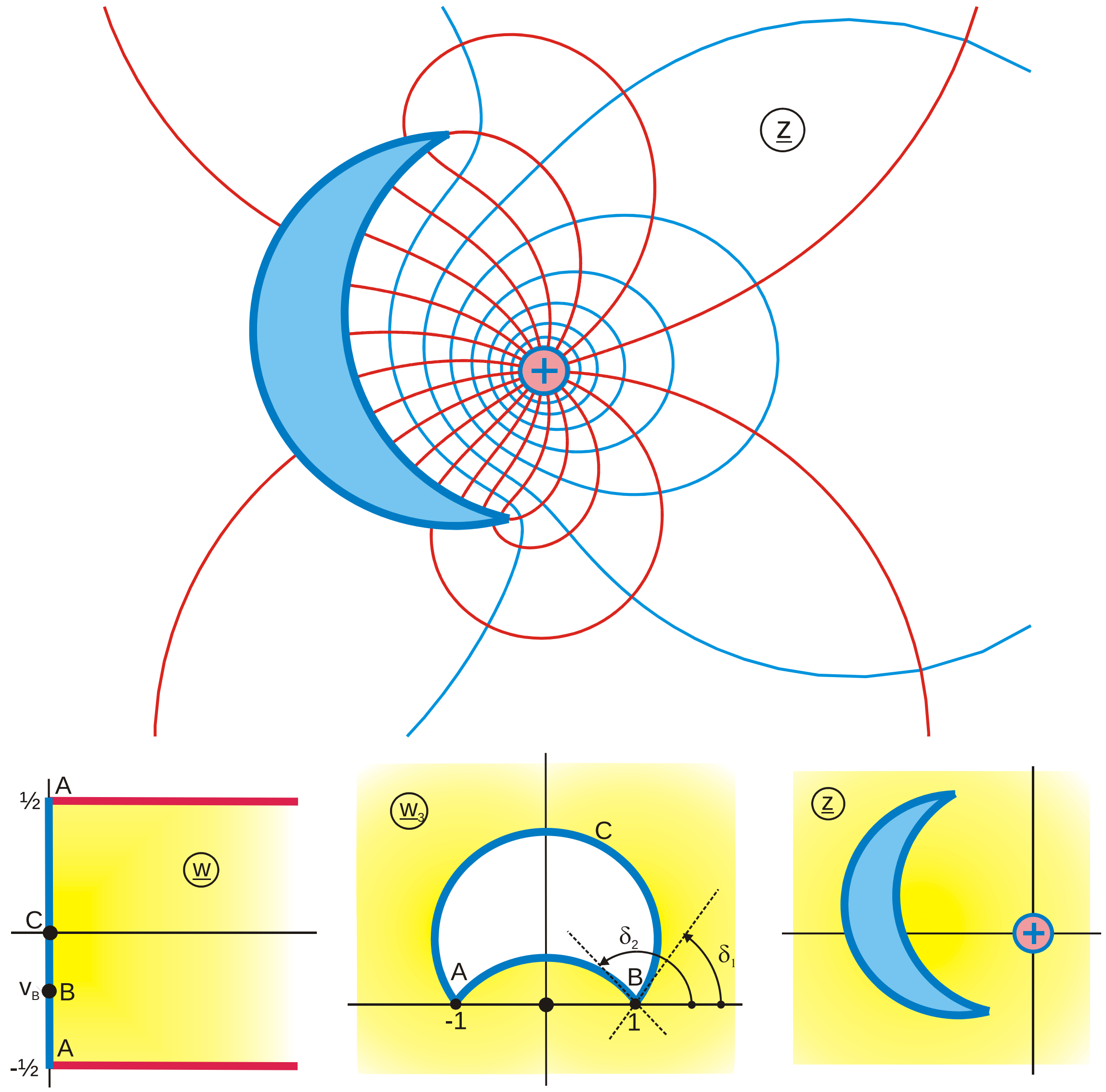


Abbildung F 2.11

$$z = \frac{1}{w_3 + \underline{c}} - \frac{1}{\underline{c}}$$

$$w_3 = \frac{1 - w_2}{1 + w_2}$$

$$v_B = \frac{1}{\pi}\arctan\frac{a}{b}$$

$$w_2 = e^{j\delta_2}\, w_1^{(2-\delta_2/\pi+\delta_1/\pi)}$$

$$w_1 = a + jb\tanh(w\pi)$$

$$\varphi = \frac{2\pi - \delta_2}{2 - \delta_2/\pi + \delta_1/\pi}$$

$\delta_2 \geq \delta_1$

$a = \cos\varphi$ $b = \sin\varphi$

$0 \leq u \leq 0{,}4$ $-0{,}5 \leq v \leq 0{,}5$

$\delta_1 = 100°$ $\delta_2 = 130°$

$c = 1.8 - j1.8$

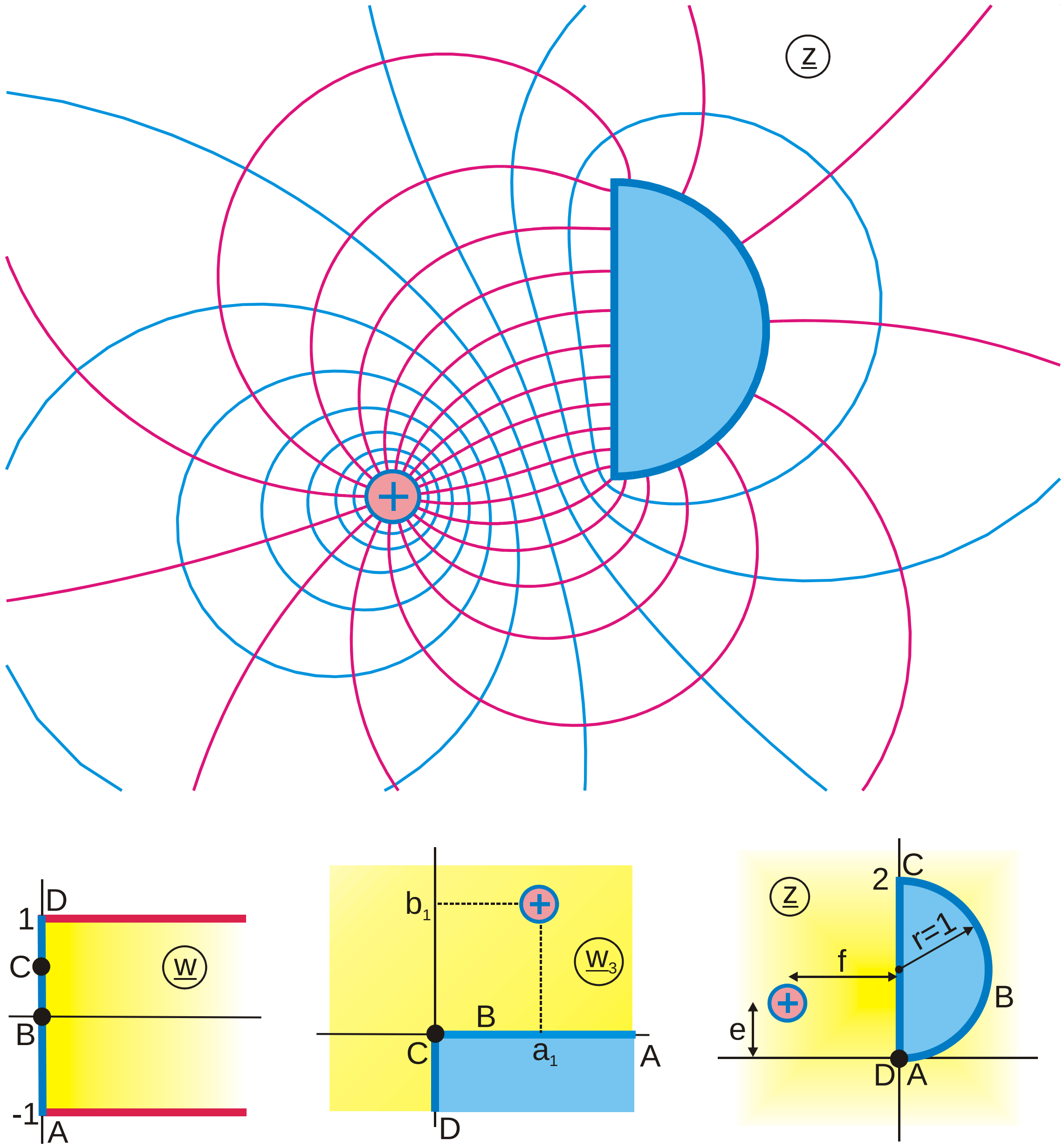


Abbildung F 2.12

$z = 2c / w_4$

$w_4 = w_3 - jc$

$w_3 = w_2^{3/2}$

$w_2 = a + jbw_1$

$w_1 = \tanh \frac{w\pi}{2}$

$a + jb = (a_1 + jb_1)^{2/3}$

$v_C = \frac{2}{\pi} \arctan \frac{a}{b}$

$a_1 + jb_1 = \frac{2c}{f + je} + jc$

$0 \leq u \leq 1{,}2$

$-1 \leq v \leq 1$

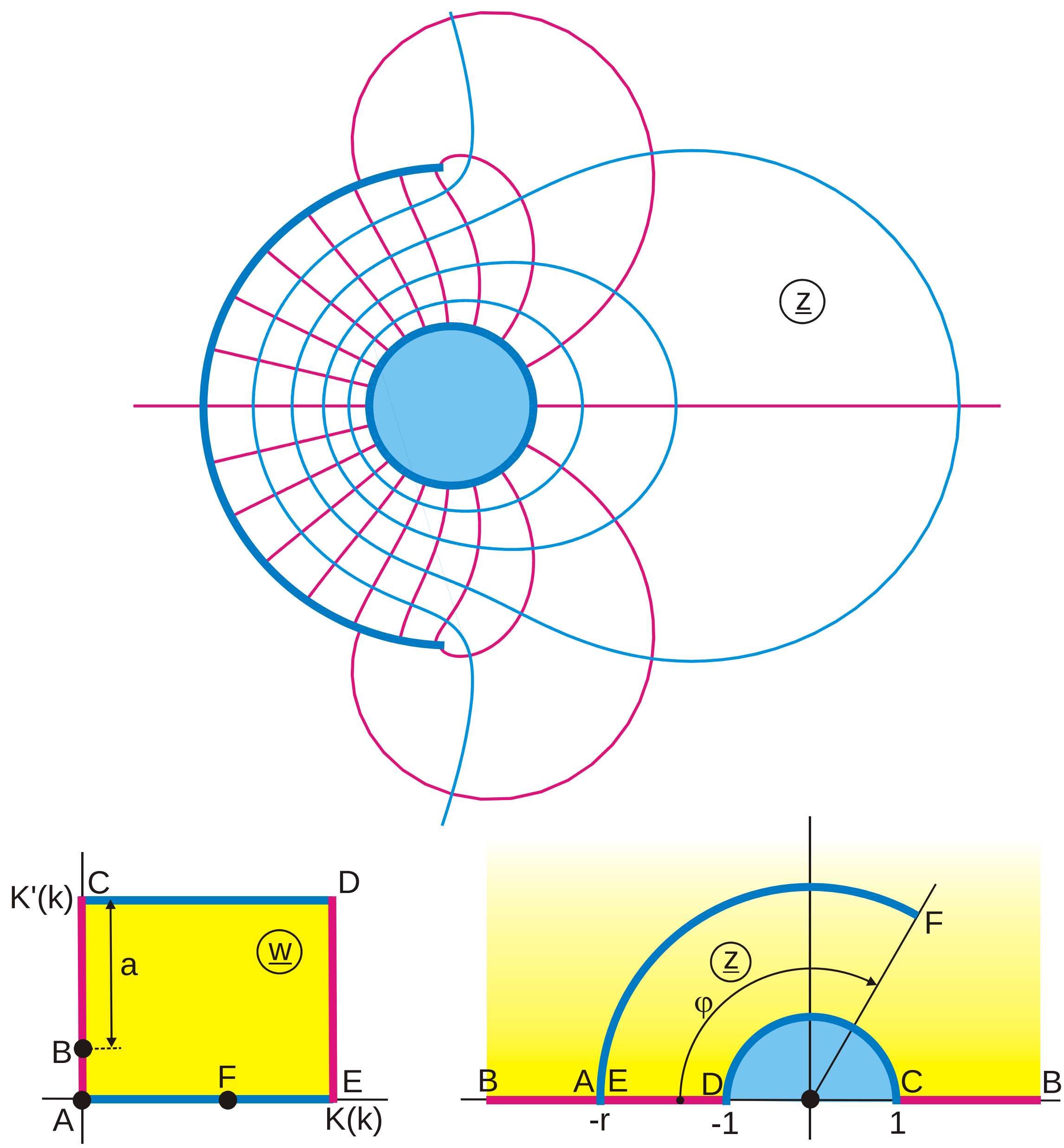


Abbildung F 3

$$z = -r\frac{\vartheta_4\left[\frac{\pi}{2K}(w-ja),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K}(w+ja),\tau\right]}$$

$$\sigma = \frac{Z(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja)+\mathrm{sn}(ja)Z(ja,k)\right]}$$

$$a = \ln r\,\frac{K(k)}{\pi}$$

$$u_F = F_a\left(\sqrt{\sigma},k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K}(u_F+ja),\tau\right]$$

$$v_B = K'(k)-a$$

$$0 < a < K'(k)$$

$$\tau = \frac{K'(k)}{K(k)}$$

$$0 \le u \le K(k)$$

$$0 \le v \le K'(k)$$

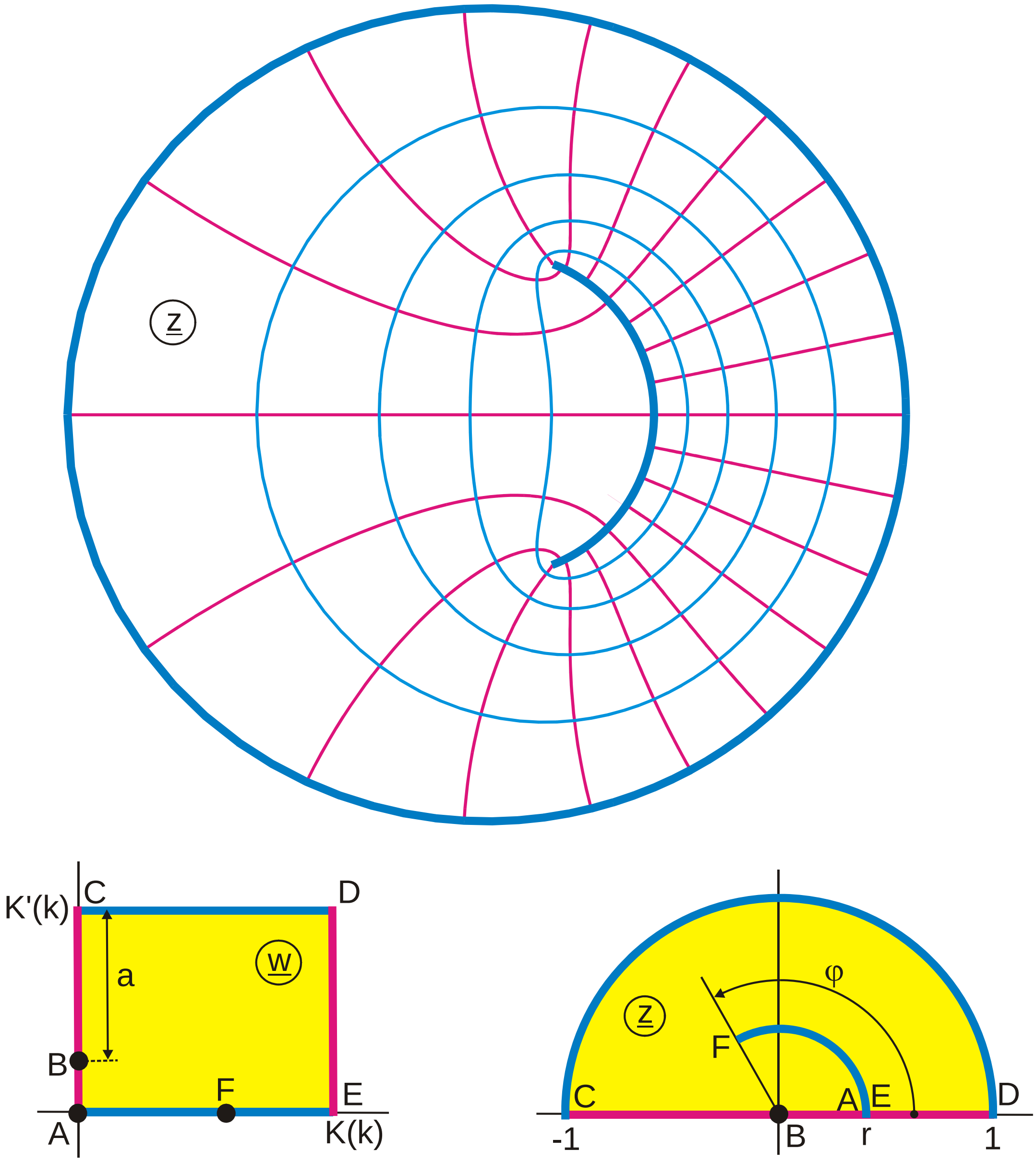


Abbildung F 3.1

$$z = r\frac{\vartheta_4\left[\frac{\pi}{2K}(w+ja),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K}(w-ja),\tau\right]}$$

$$\sigma = \frac{Z(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja)+\mathrm{sn}(ja)Z(ja,k)\right]}$$

$$a = -\ln r\,\frac{K(k)}{\pi}$$

$$u_F = F_a\left(\sqrt{\sigma},k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K}(u_F+ja),\tau\right]$$

$$v_B = K'(k) - a$$

$$0 < a < K'(k)$$

$$\tau = \frac{K'(k)}{K(k)}$$

$$0 \le u \le K(k)$$

$$0 \le v \le K'(k)$$

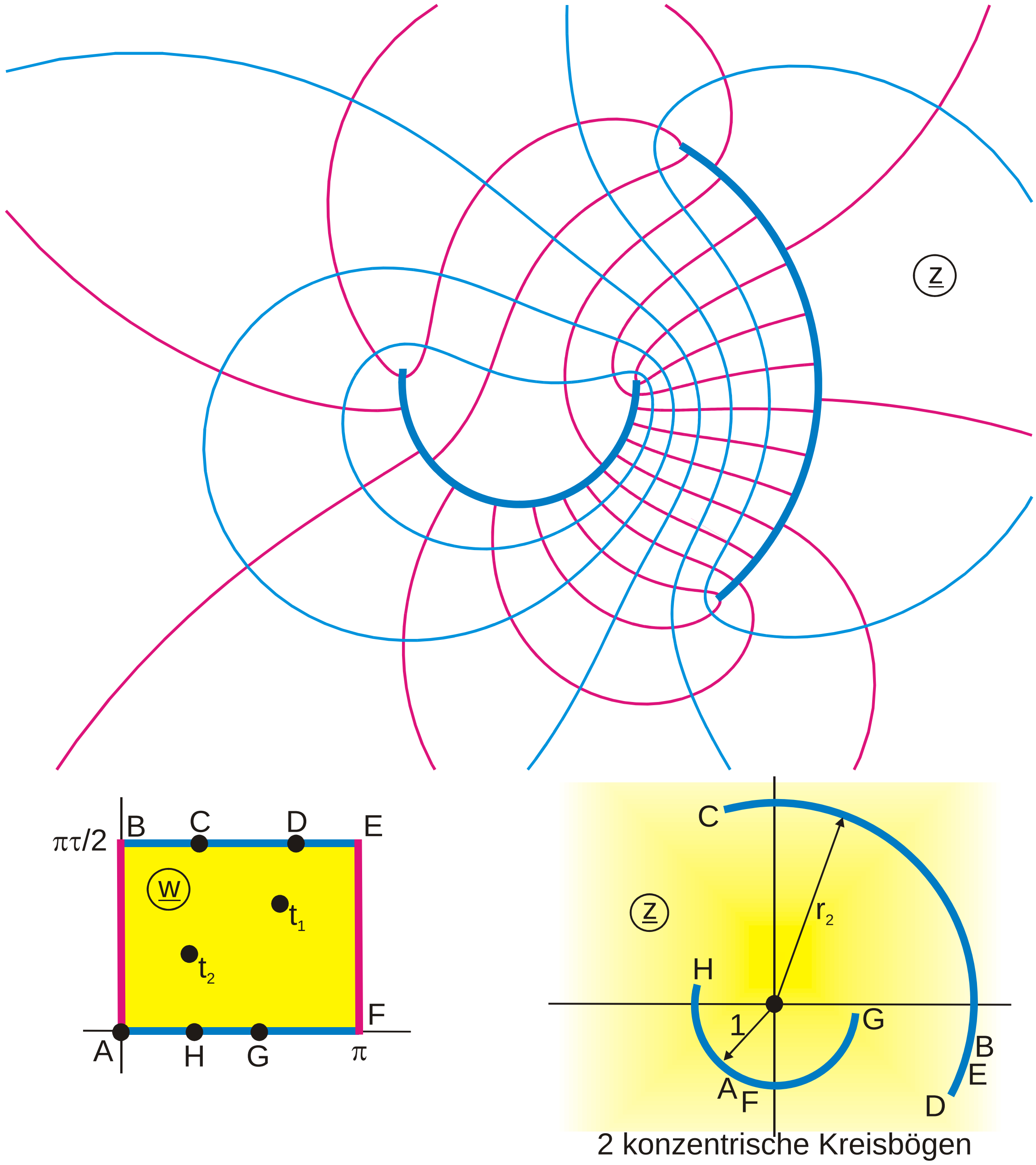


Abbildung F 3.2

$$z = \frac{\vartheta_1\left[\left(w - t_1\right), \tau\right]\vartheta_1\left[\left(w - t_2^*\right), \tau\right]}{\vartheta_1\left[\left(w - t_2\right), \tau\right]\vartheta_1\left[\left(w - t_1^*\right), \tau\right]}$$

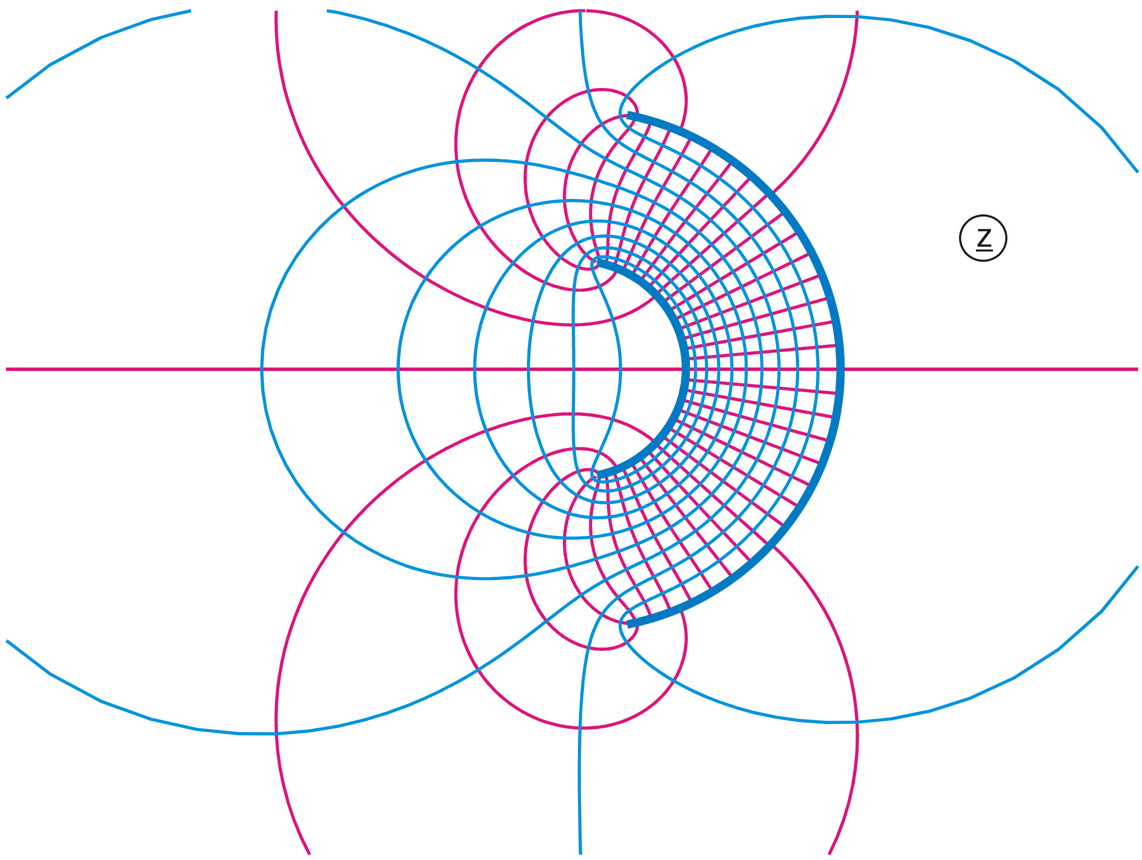
$$r_2 = \exp\left[\pi\left(\operatorname{Im} t_2 - \operatorname{Im} t_1\right)\right]$$

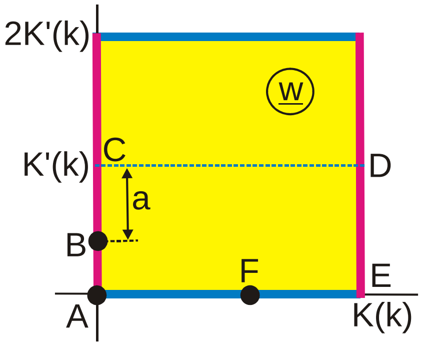
$0 \le u \le \pi$ $\qquad$ $0 \le v \le \pi\tau/2$

Sonderfälle:

Symmetrie I zur x-Achse: $\operatorname{Re} t_1 = 0$ $\qquad$ $\operatorname{Re} t_2 = \pi/2$

Symmetrie II zur x-Achse: $\operatorname{Re} t_1 = \pi/2$ $\qquad$ $\operatorname{Re} t_2 = \pi/2$





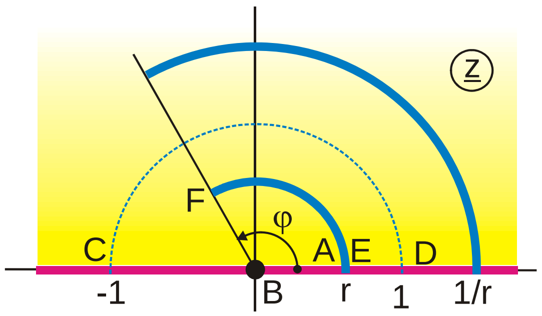


Abbildung F 3.3

$$z = r\frac{\vartheta_4\left[\frac{\pi}{2K}(w+ja),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K}(w-ja),\tau\right]}$$

$$\sigma = \frac{Z(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja)+\mathrm{sn}(ja)Z(ja,k)\right]}$$

$$a = -\ln r\,\frac{K(k)}{\pi}$$

$$u_F = F_a\left(\sqrt{\sigma},k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K}(u_F+ja),\tau\right]$$

$$v_B = K'(k) - a$$

$$0 < a < K'(k)$$

$$\tau = \frac{K'(k)}{K(k)}$$

$$0 \le u \le K(k)$$

$$0 \le v \le K'(k)$$

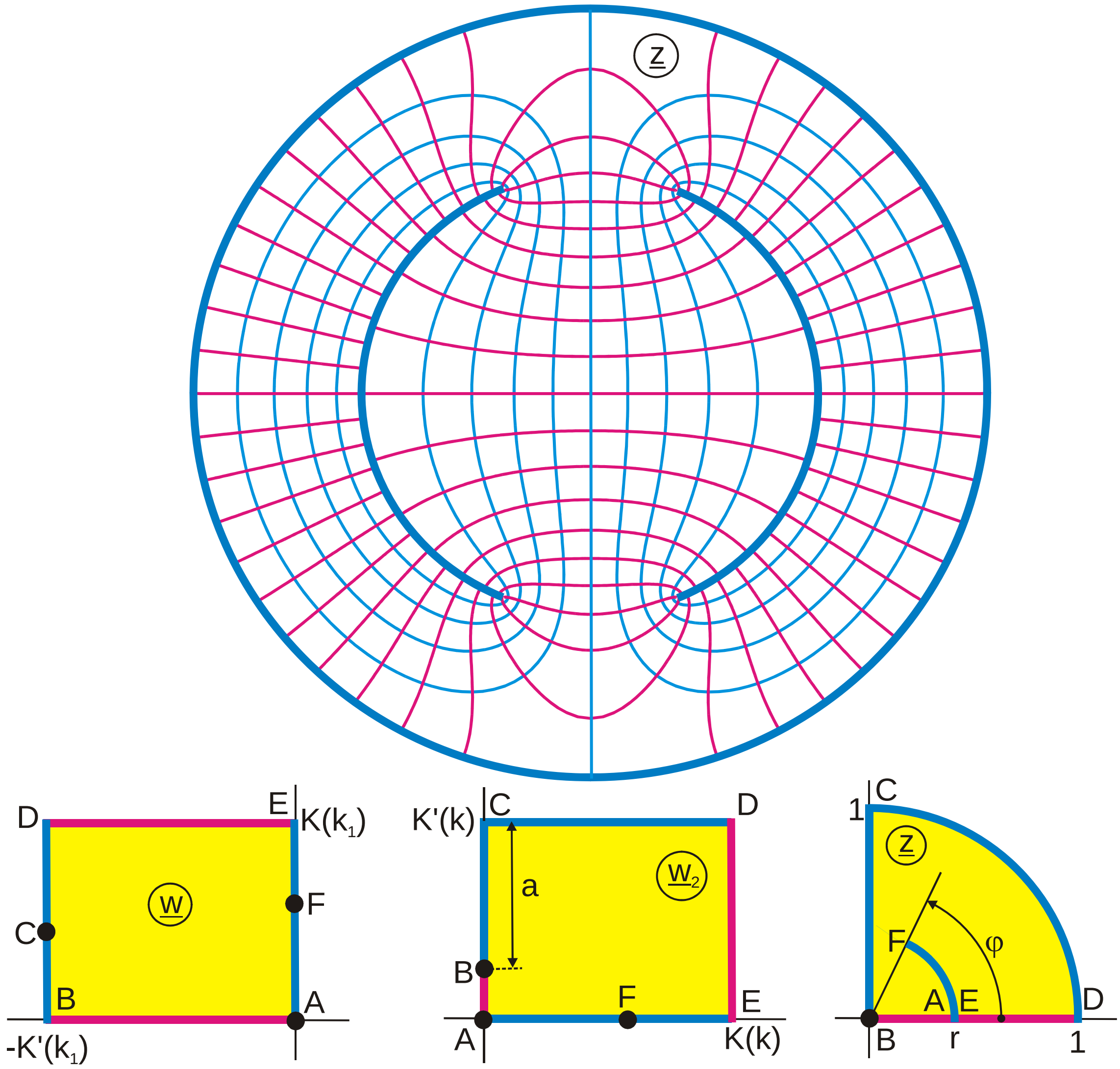


Abbildung F 3.4

$$z = r\sqrt{\frac{\vartheta_4\left[\frac{\pi}{2K}(w_2+ja),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K}(w_2-ja),\tau\right]}}$$

$$\sigma = \frac{Z(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja)+\mathrm{sn}(ja)Z(ja,k)\right]}$$

$$w_2 = -jF_a(w_1,k')$$

$$w_1 = \frac{k_1'}{k'}\mathrm{sn}(w,k_1')$$

$$k_1' = k'\,\mathrm{sn}(v_B,k')$$

$$a = -\frac{2K(k)}{\pi}\ln r$$

$$u_F = F_a\left(\sqrt{\sigma},k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K}(u_F+ja),\tau\right]$$

$$v_B = K'(k) - a$$

$$0 < a < K'(k)$$

$$\tau = \frac{K'(k)}{K(k)}$$

$-K'(k) \le u \le 0$

$0 \le v \le K'(k)$

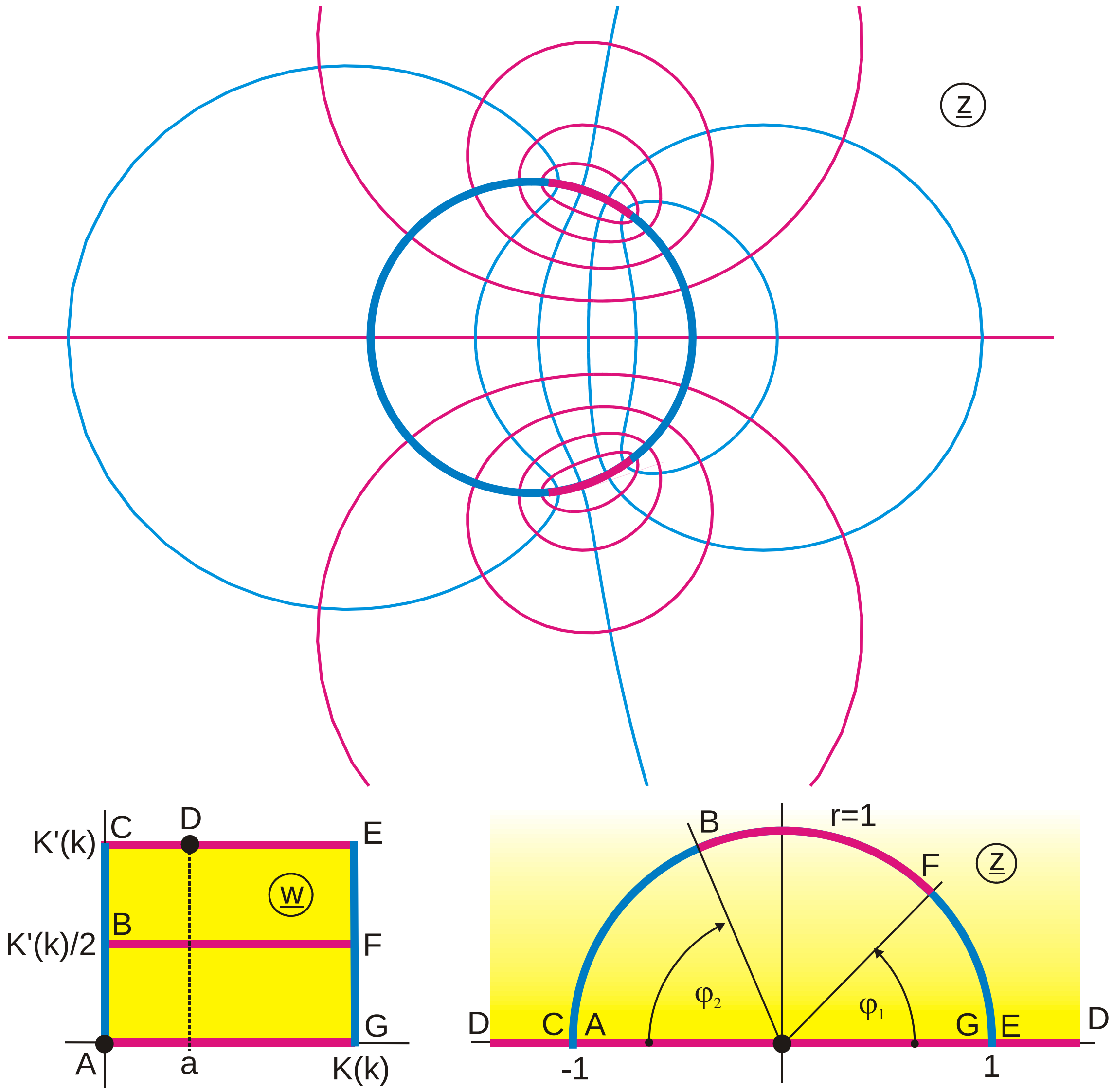


Abbildung F 3.5

$$z = \frac{\operatorname{sn}(w-a,k)}{\operatorname{sn}(w+a,k)}$$

$$\varphi_1 = 2\arctan\frac{(1-k)\operatorname{sn}(a,k)}{\operatorname{cn}(a,k)\operatorname{dn}(a,k)} \qquad \varphi_2 = 2\arctan\frac{\operatorname{cn}(a,k)\operatorname{dn}(a,k)}{(1+k)\operatorname{sn}(a,k)}$$

$0 \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

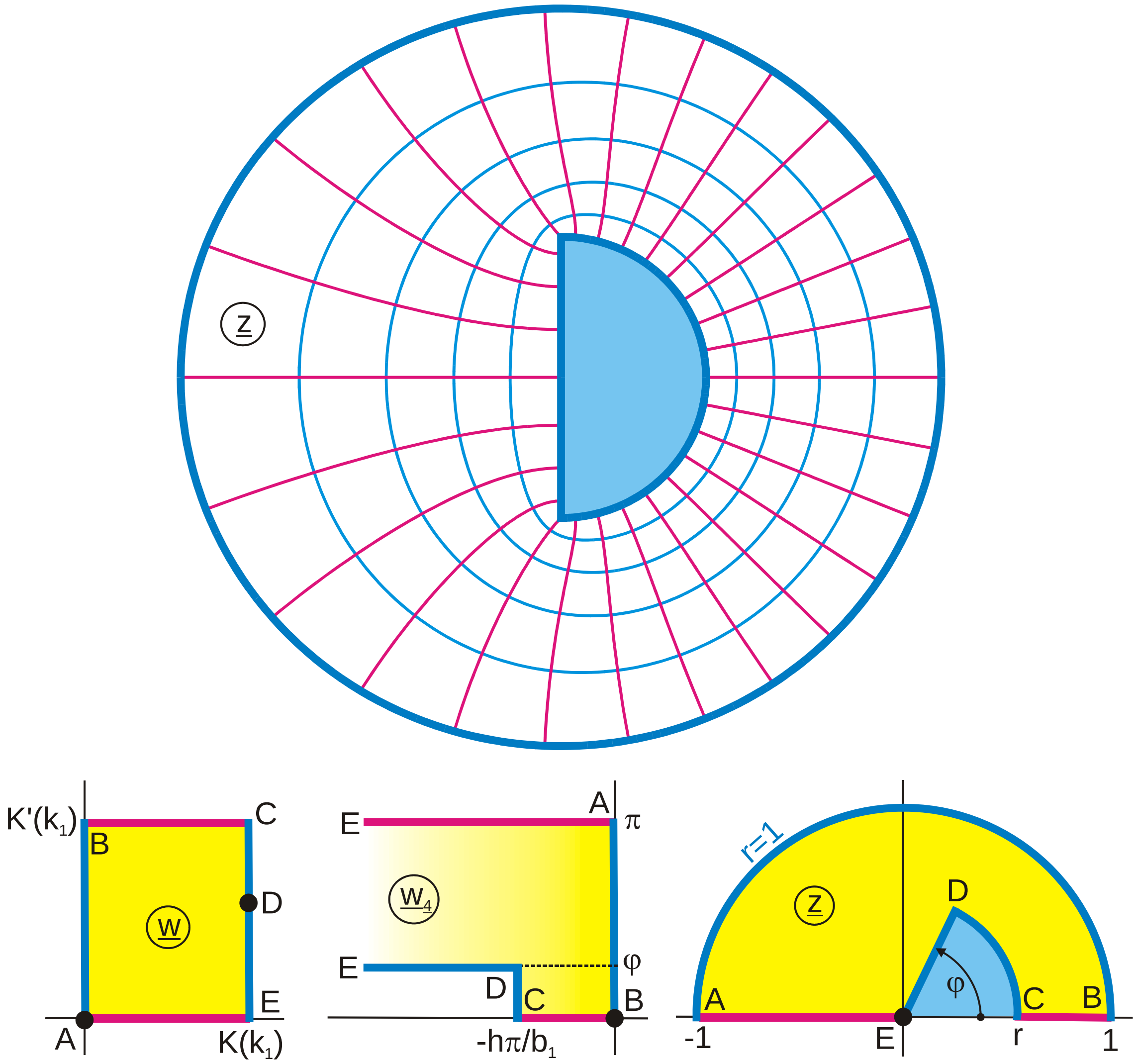


Abbildung F 3.6

$$z = \exp(w_4) \qquad w_4 = \frac{\pi}{b_1}(w_3 - h) \qquad w_3 = \Pi_e(w_2, k, a)$$

$$w_2 = K(k) + j\,K'(k) - F_a(w_1, k) \qquad w_1 = \frac{k_1}{k}\,\mathrm{sn}(w, k_1)$$

$$\text{gegeben}: \tau = K'(k)/K(k)\,,\, d \qquad h = K(k)\{1 + b\,Z_e(a,k)\}$$

$$b_1 = b\left\{K'(k)\,Z_e(a,k) + \frac{\pi a}{2K(k)}\right\} + K'(k) \qquad v_D = \operatorname{Im} F_a\left(\frac{k}{k_1}, k_1\right)$$

$$b_2 = b\left\{K'(k)\,Z_e(a,k) + \frac{\pi a}{2K(k)} - \frac{\pi}{2}\right\} + K'(k) \qquad r = \exp\frac{-h\pi}{b_1}$$

$$a = (1-d)\,K(k) \qquad k = \{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\}^2$$

$$k_1 = k\,\mathrm{sn}\{d\;K(k), k\} \qquad \tau = 2{,}2;\; d = 0{,}3505 \qquad b = \frac{\mathrm{sn}(a,k)}{c\,\mathrm{n}(a,k)\,\mathrm{dn}(a,k)}$$

$$0 \le u \le K(k_1) \qquad \varphi = \pi\frac{b_2}{b_1} \qquad 0 \le v \le K'(k_1)$$

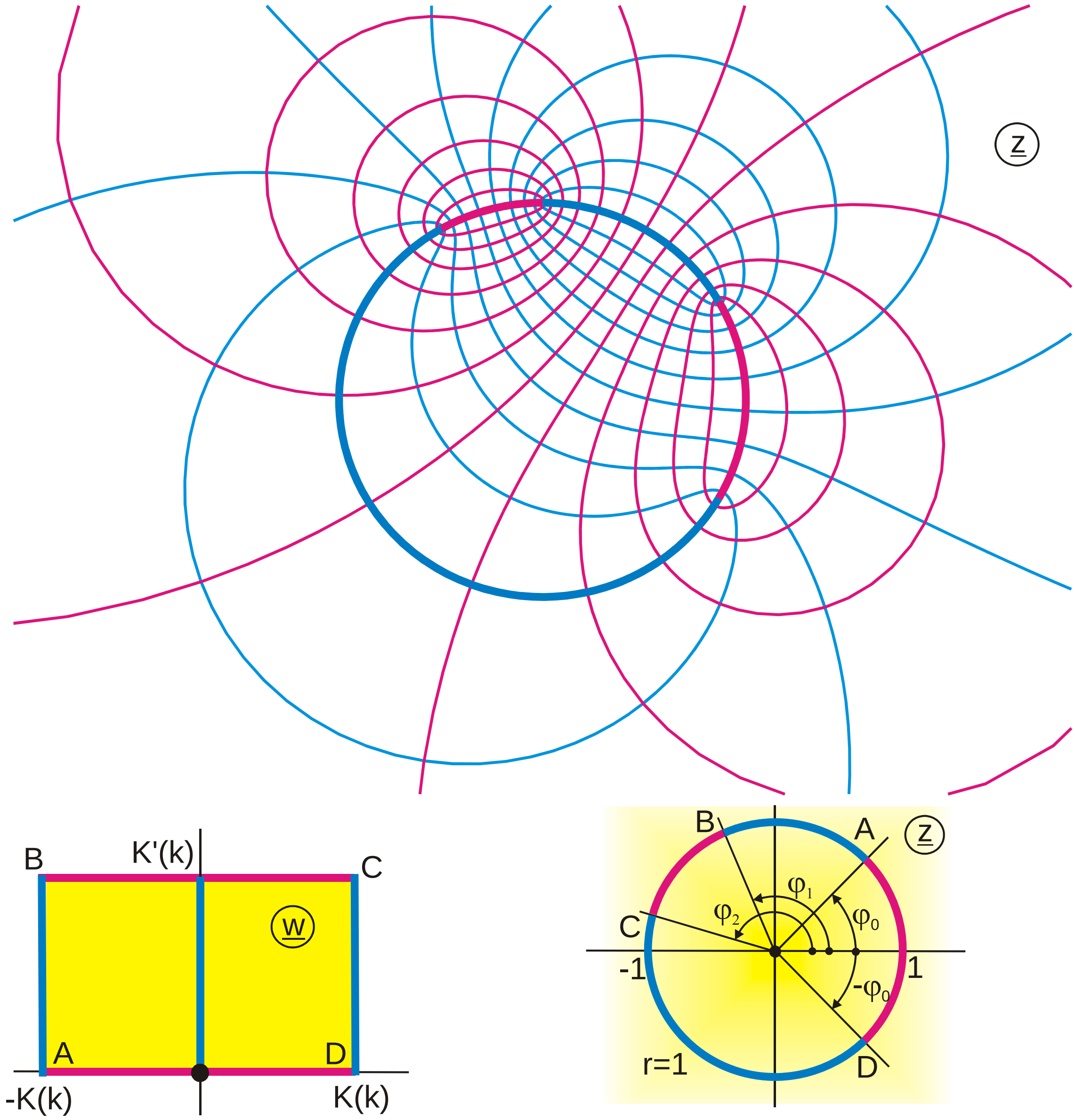


Abbildung F 3.7

$$z = b\frac{w_1 + j}{w_1 - j} \quad \text{für } |z \geq 1|$$

$$z = b\left(\frac{w_1 + j}{w_1 - j}\right)^* \quad \text{für } |z \leq 1|$$

$$w_1 = -\frac{k + \sigma\,\mathrm{sn}(w,k)}{\sigma + k\,\mathrm{sn}(w,k)}$$

$$b = \frac{1}{\tan(\varphi_0/2)}$$

$$a_1 = \frac{1}{b\tan(\varphi_1/2)}$$

$$a_2 = \frac{1}{b\tan(\varphi_2/2)}$$

$$k = \frac{1 - a_1a_2}{a_1 - a_2} - \sqrt{\left(\frac{1 - a_1a_2}{a_1 - a_2}\right)^2 - 1}$$

$$\sigma = k\frac{k - a_1}{1 - ka_1}$$

$-K(k) \leq u \leq K(k)$

$0 \leq v \leq K'(k)$

Die Linie u = 0 ist ein Kreis, der den kleineren Kreisbogen umschlingt.

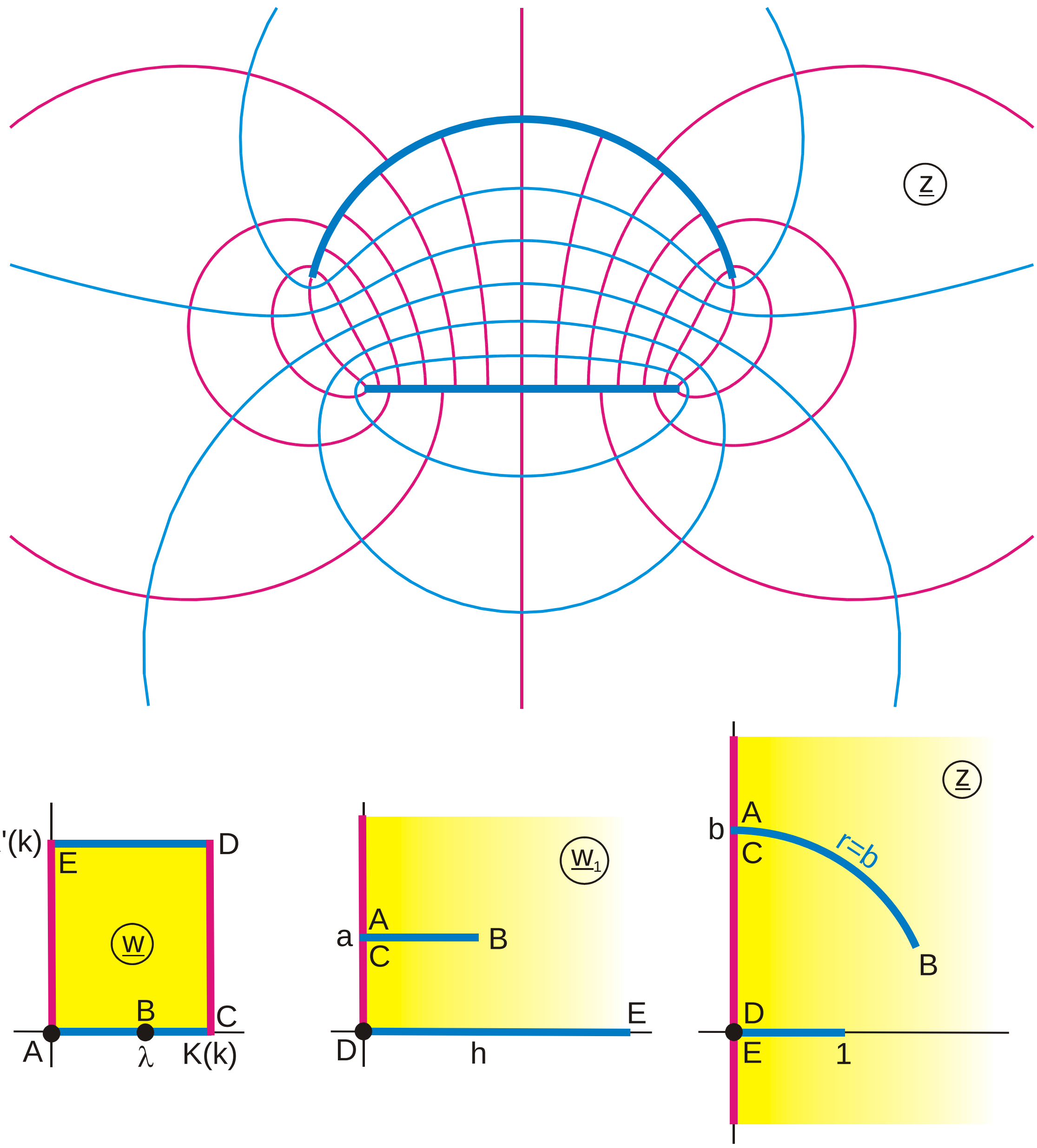


Abbildung F 3.8

$$z = 2\frac{w_1}{1 + w_1^2}$$

$$w_1 = Z_e(w,k) + ja$$

gegeben: k

$$h = Z_e(\lambda, k)$$

$$\lambda = F_a\left(\frac{1}{k}\sqrt{1 - \frac{E(k)}{K(k)}}, k\right)$$

$$a = \frac{\pi}{2K(k)}$$

$$b = \frac{2a}{1 - a^2}$$

$$0 \le u \le K(k)$$

$$0 \le v \le K'(k)$$

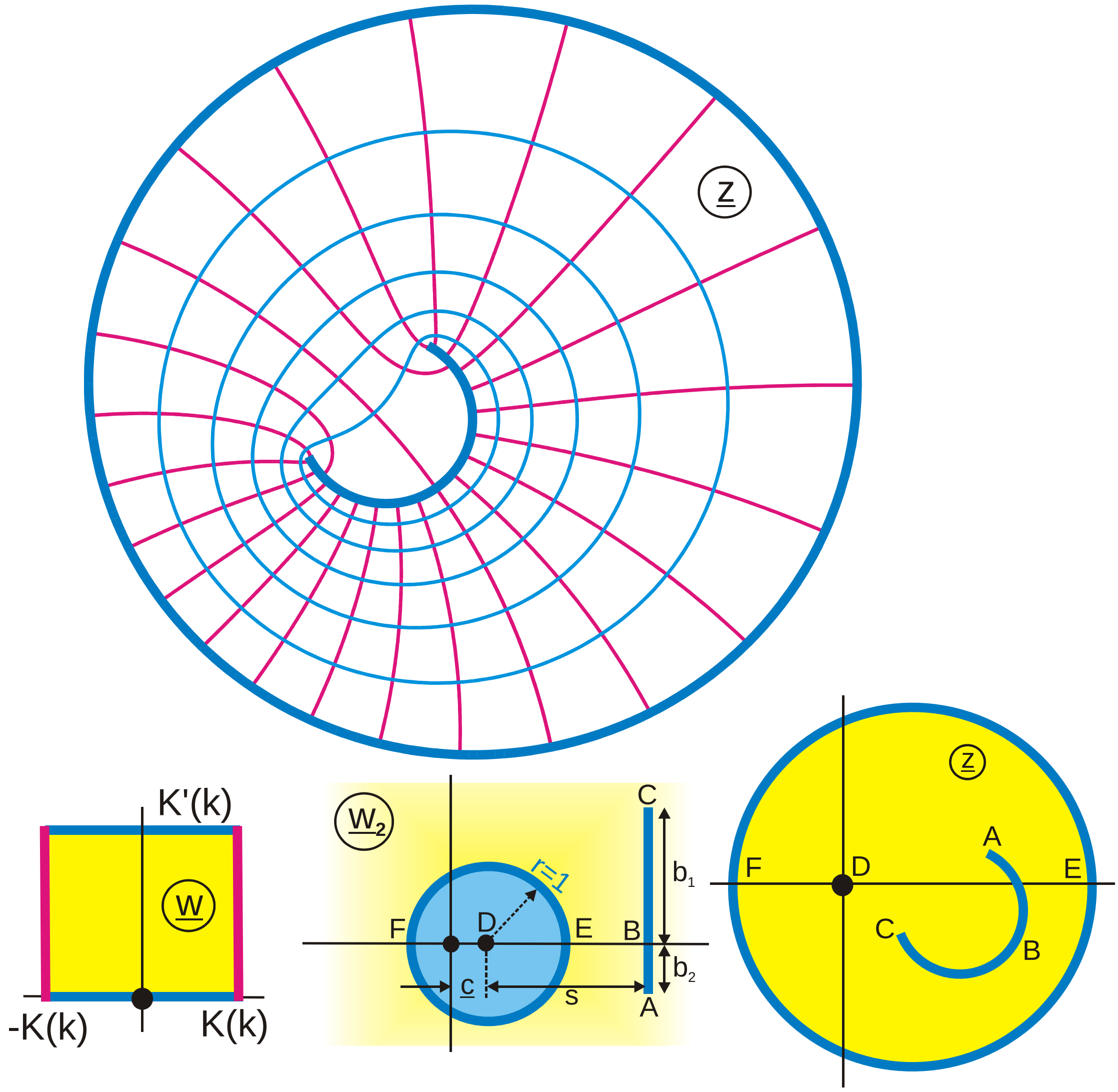


Abbildung F 3.9

$$z = \frac{1}{w_2} \qquad w_2 = \frac{1}{\rho w_1} + r \qquad w_1 = r\left\{1 + \exp(j\beta)\frac{\vartheta_4\left[\pi\left(w + ja\right)/2K(k), \tau\right]}{\vartheta_4\left[\pi\left(w - ja\right)/2K(k), \tau\right]}\right\}$$

$$r = s - \sqrt{s^2 - 1} \qquad \sigma = \frac{Z(ja, k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja) + \mathrm{sn}(ja)Z(ja, k)\right]}$$

$$a = -\ln r\,\frac{K(k)}{\pi} \qquad \rho = \frac{1}{1 - r^2} \qquad u_E = -F_a\left(\sqrt{\sigma}, k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K(k)}\left(-u_E + ja\right), \tau\right] \qquad 0 < a < K'(k) \qquad \tau = \frac{K'(k)}{K(k)}$$

$$b_1 = \frac{1}{\rho}\mathrm{Im}\left\{\frac{1}{r + r\exp(-j[\varphi - \beta])}\right\} \qquad b_2 = \frac{1}{\rho}\mathrm{Im}\left\{\frac{1}{r + r\exp(-j[\varphi + \beta])}\right\}$$

gegeben: s, β, k, $\underline{c}$ $\qquad$ $-K(k) \le u \le 0$ $\qquad$ $0 \le v \le K'(k)$

$A: 1/(s + \underline{c} + jb_2)$ $\qquad$ $B: 1/(s + \underline{c})$ $\qquad$ $C: 1/(s + \underline{c} + jb_1)$

$E: 1/(1 + \underline{c})$ $\qquad$ $F: 1/(1 - \underline{c})$ $\qquad$ $|\underline{c}| < 0{,}5$

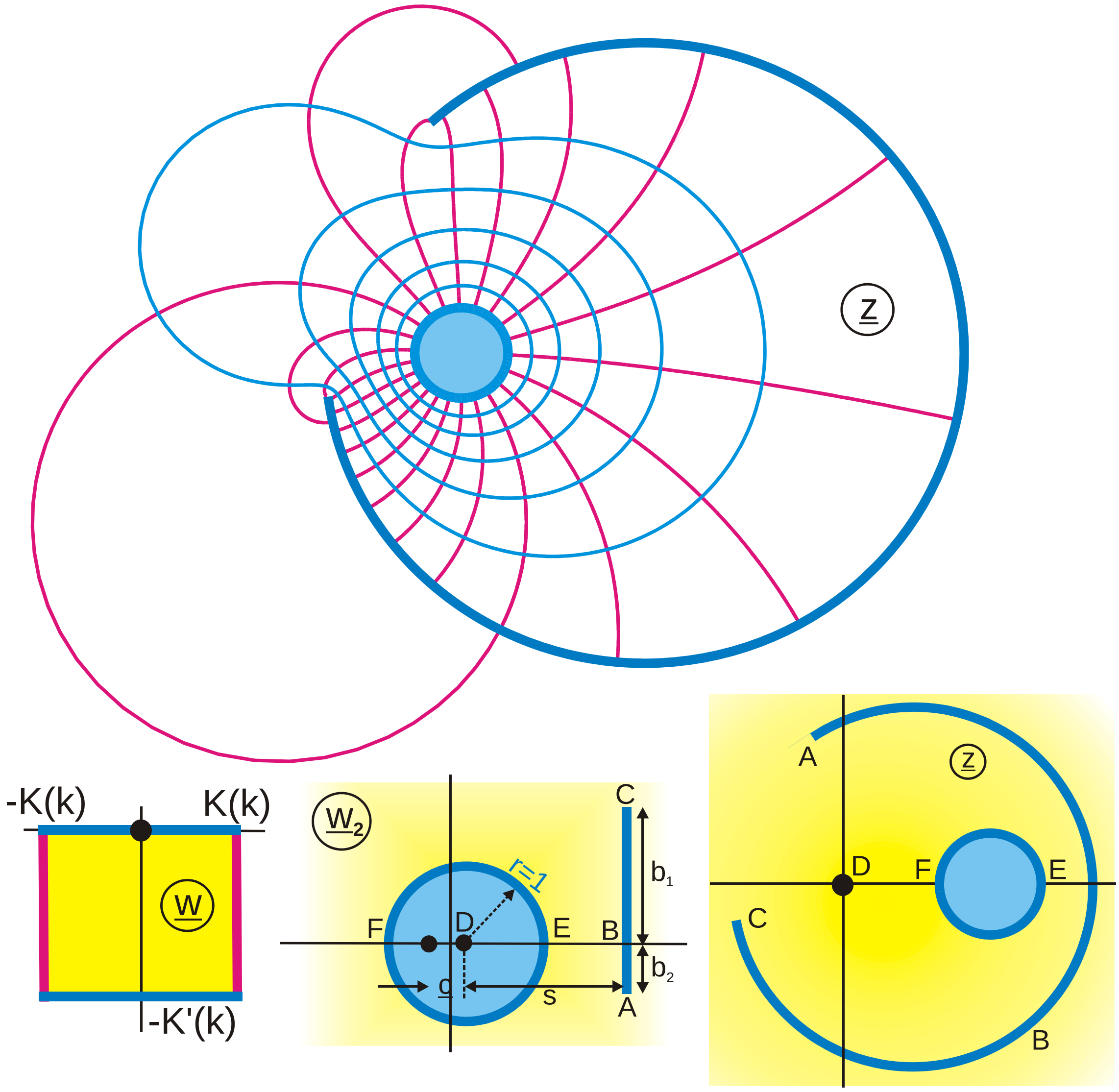


Abbildung F 3.10

$$z = \frac{1}{w_2} \qquad w_2 = \frac{1}{\rho w_1} + r \qquad w_1 = r\left\{1 + \exp(j\beta)\frac{\vartheta_4\left[\pi(w+ja)/2K(k),\tau\right]}{\vartheta_4\left[\pi(w-ja)/2K(k),\tau\right]}\right\}$$

$$r = s - \sqrt{s^2 - 1} \qquad \sigma = \frac{Z(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja) + \mathrm{sn}(ja)Z(ja,k)\right]}$$

$$a = -\ln r\,\frac{K(k)}{\pi} \qquad \rho = \frac{1}{1-r^2} \qquad u_E = -F_a\left(\sqrt{\sigma},k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K(k)}\left(-u_E + ja\right),\tau\right] \qquad 0 < a < K'(k) \qquad \tau = \frac{K'(k)}{K(k)}$$

$$b_1 = \frac{1}{\rho}\,\mathrm{Im}\left\{\frac{1}{r + r\exp(-j[\varphi-\beta])}\right\} \qquad b_2 = \frac{1}{\rho}\,\mathrm{Im}\left\{\frac{1}{r + r\exp(-j[\varphi+\beta])}\right\}$$

gegeben: s, β, k, $\underline{c}$ $\qquad$ $-K(k) \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

$A: 1/(s + \underline{c} + jb_2)$ $\qquad$ $B: 1/(s + \underline{c})$ $\qquad$ $C: 1/(s + \underline{c} + jb_1)$

$E: 1/\underline{c}$ $\qquad$ $F: 1/(2 - \underline{c})$

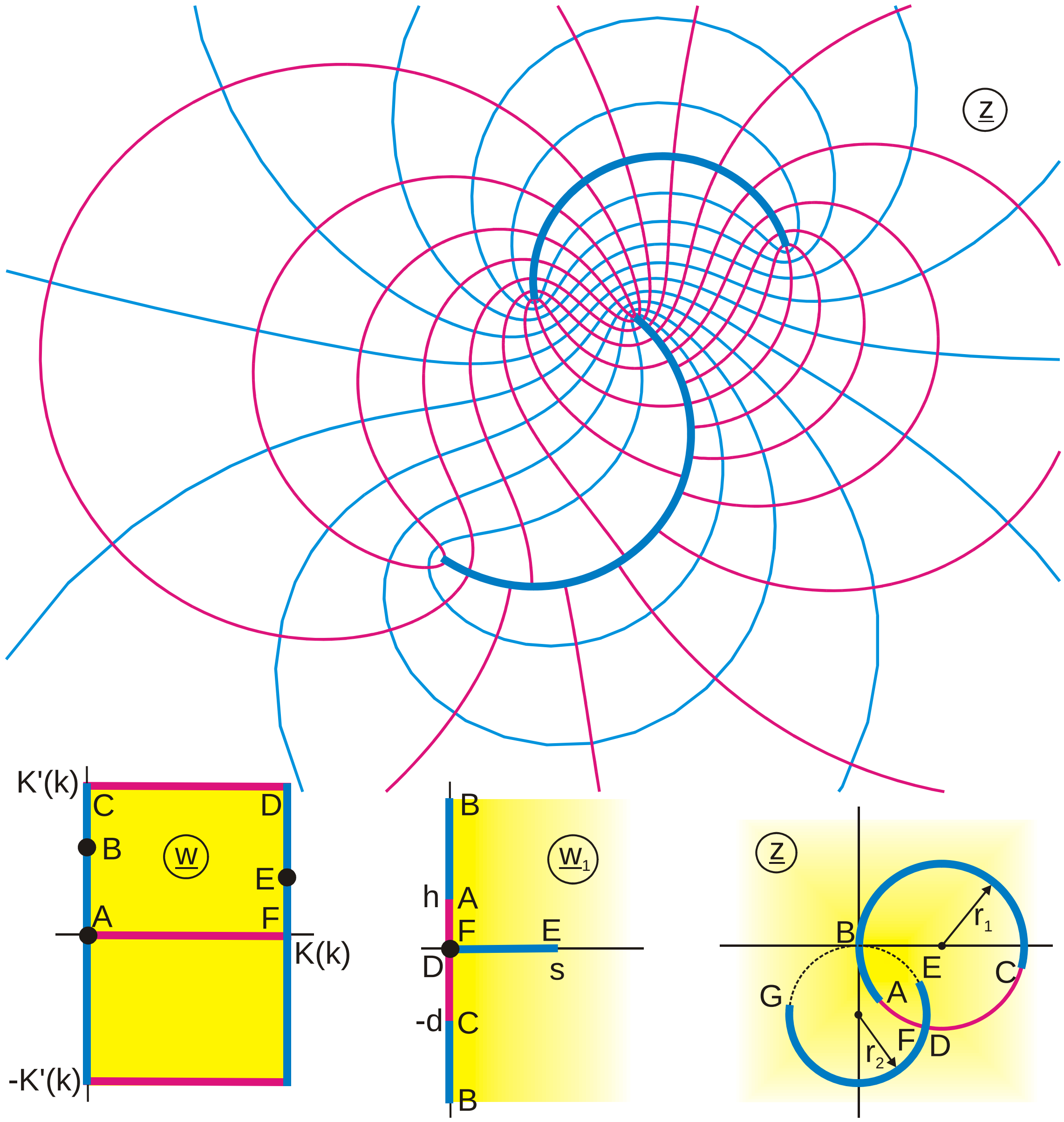


Abbildung F 3.11

$$z = \frac{1}{w_1 + b + jc} \qquad w_1 = \frac{\sqrt{k}}{2}\{\mathrm{sn}(w + ja,k) - \mathrm{sn}(w - ja,k)\}$$

$$v_E = F_a\left(\sqrt{\frac{1 + k^2\,\mathrm{sn}^2(ja,k)}{2 - k'^2 + 2k^2\,\mathrm{sn}^2(ja,k)}},k'\right) \qquad a = \mathrm{Im}\,F_a\left(\frac{jh}{\sqrt{k}},k\right)$$

$$s = \frac{\sqrt{k}}{2}\{\mathrm{sn}(K(k) + jv_E + ja,k) - \mathrm{sn}(K(k) + jv_E - ja,k)\} \qquad h = \sqrt{k}\,\frac{\mathrm{sn}[a,k']}{\mathrm{cn}[a,k']}$$

$d = 1/h$ gegeben: k, h, b, c

$0 \le u \le K(k)$ $-K'(k) \le v \le K'(k)$

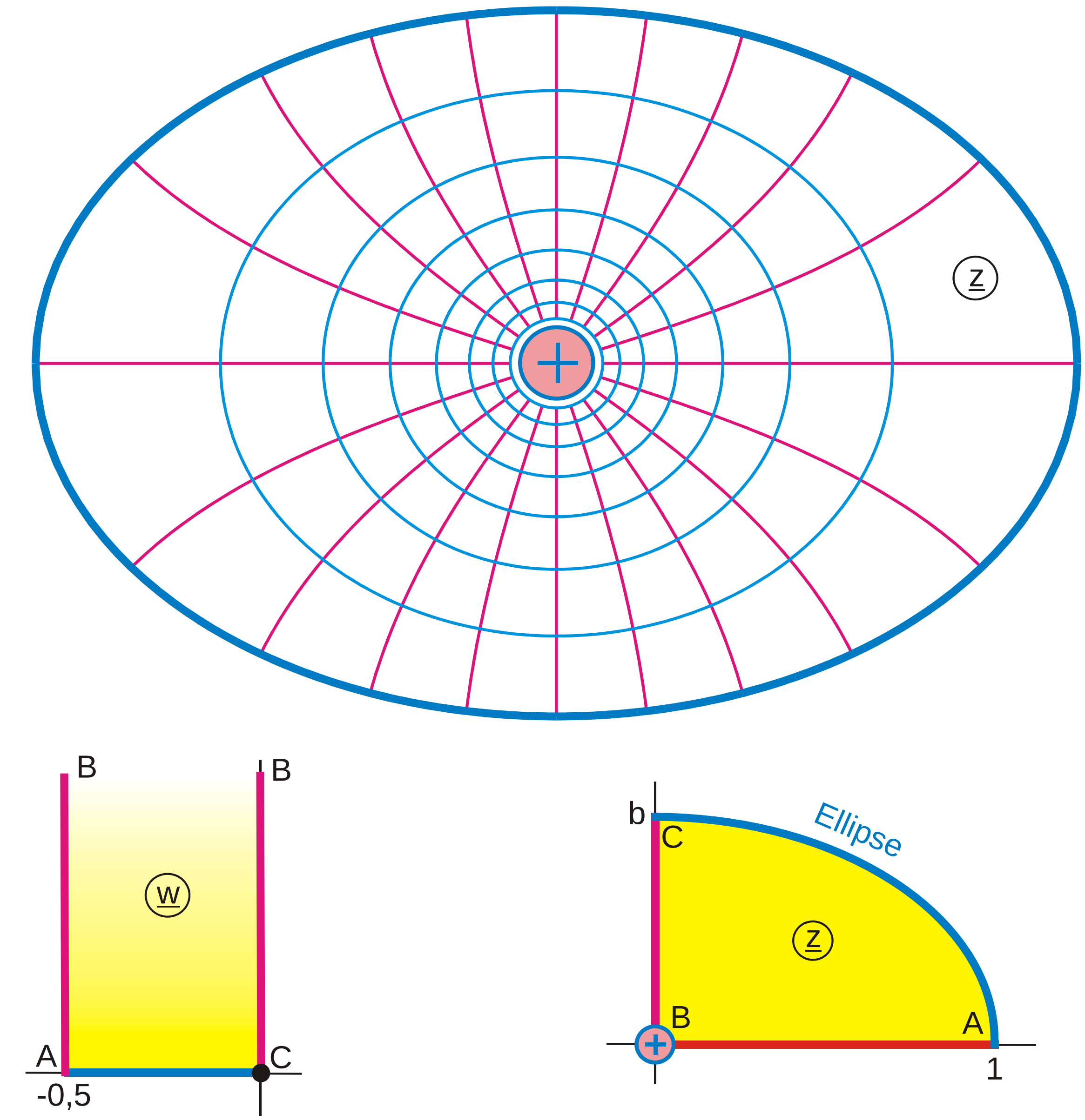


Abbildung F 4

$$z = \frac{1}{a}\sin w_2 \qquad w_2 = \pi\left[jK'(k) - w_1\right]/\left[2K(k)\right]$$

$$w_1 = F_t(w\pi, k)$$

$$a = \cosh\frac{\pi\tau}{2} \qquad b = \sinh\frac{\pi\tau}{2}$$

$$\tau = \frac{2}{\pi}\operatorname{ar\,tanh}\frac{b}{a} \qquad k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$-0{,}5 \le u \le 0$ $\qquad$ $0 \le v \le 0{,}7$

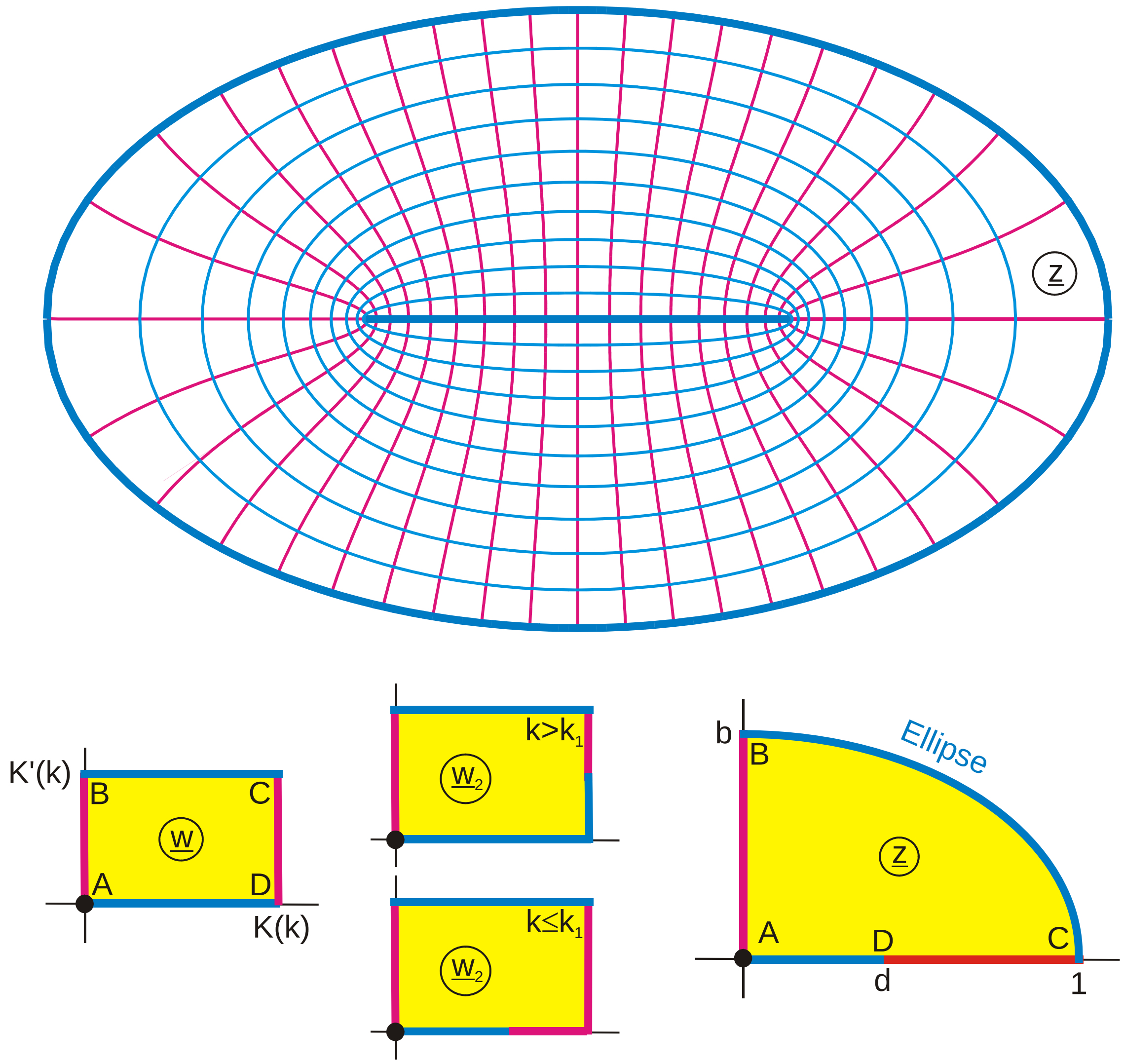


Abbildung F 4.1

$$z = \frac{1}{a}\sin w_3 \qquad w_3 = \frac{\pi}{2}\frac{w_2}{K(k_1)}$$

$$w_2 = F_a(w_1, k_1) \qquad w_1 = \frac{k}{k_1}\operatorname{sn}(w, k)$$

$$\tau = \frac{2}{\pi}\operatorname{ar\,tanh} b \qquad a = \cosh\frac{\tau\pi}{2}$$

$$k_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$k = k_1 \operatorname{sn}\left\{\frac{2}{\pi}K(k_1)\arcsin(ad), k_1\right\} \quad \textit{für } ad \le 1 \textit{ bzw. } k < k_1$$

$$k = k_1 \operatorname{Re}\operatorname{sn}\left\{K(k_1) + j\frac{\pi}{2}K(k_1)\operatorname{ar\,cosh}(ad), k_1\right\} \quad \textit{für } ad > 1$$

$$0 \le v \le K'(k) \qquad 0 \le u \le K(k)$$

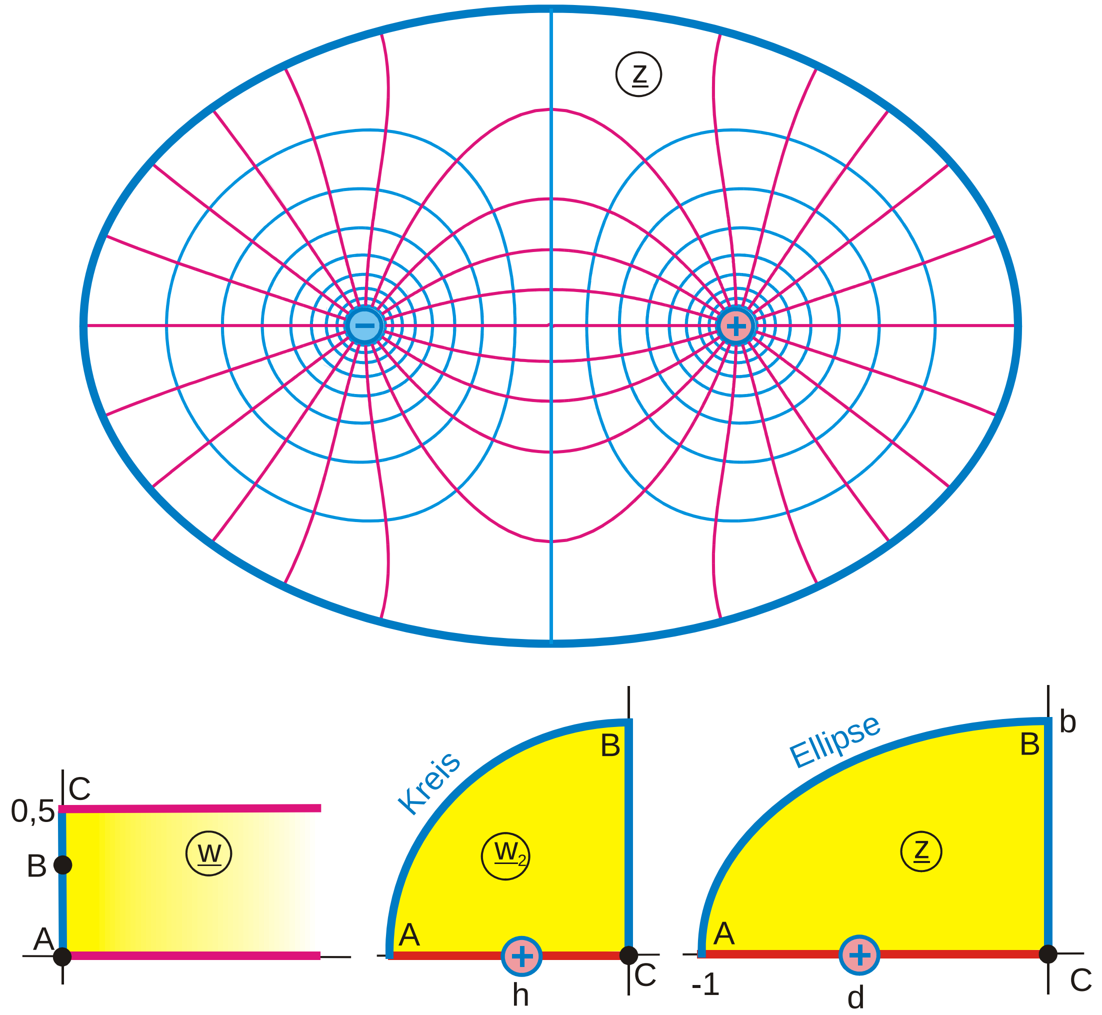


Abbildung F 4.2

$$z = f \sin\left\{\frac{\pi}{2K(k)} F_a\left(\frac{w_2}{\sqrt{k}}, k\right)\right\}$$

$$w_2 = -w_1 - \sqrt{w_1^{\,2} + 1}$$

$$w_1 = a \tanh(w\pi)$$

$$\tau = \frac{4}{\pi} ar\tanh b$$

$$a = \frac{1}{2}\left(h - \frac{1}{h}\right)$$

$$k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$h = \sqrt{k}\,\mathrm{sn}\left\{\frac{2}{\pi} K(k) \arcsin(\frac{d}{f}), k\right\}$$

$$v_B = \frac{1}{\pi}\arctan\frac{1}{a}$$

$$f = \sqrt{1 - b^2}$$

$0 \le v \le 0,5$

$0 \le u \le 0,4$

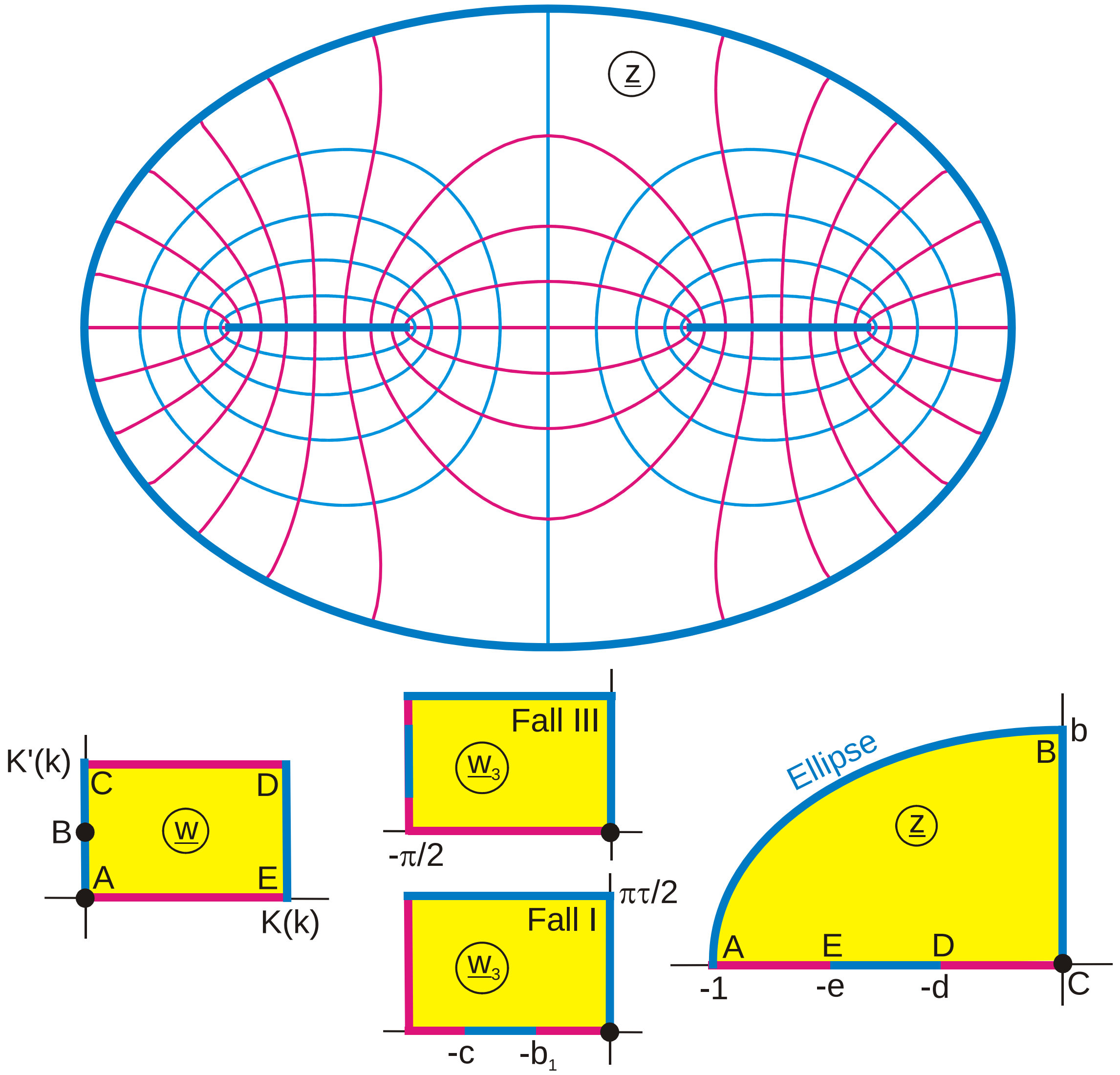


Abbildung F 4.3

$z = \frac{1}{f} \sin w_3$

$w_3 = \frac{\pi}{2} \{ j\, w_2 / K'(k_1) - 1 \}$

$w_2 = F_t(w_1, k_1)$

$w_1 = \pi/2 - \arcsin[a \operatorname{sn}(w, k)]$

$\tau = \frac{\pi}{2 \operatorname{ar} \tanh b}$

$f = \cosh \frac{\pi}{2\tau}$

$k_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)} \right]^2$

$v_E = \operatorname{Im} F_a \left(j \frac{\sqrt{1/k_1^2 - 1}}{a}, k \right)$

I: $a = 1 \Big/ \sqrt{1 - \operatorname{sn}^2 [c\, K(k_1), k_1']}$

III: $a = \sqrt{1 - \operatorname{sn}^2 [c\, K(k_1), k_1]}$

I: $c = \tau [1 - (2/\pi) \arcsin(fe)]$

III: $c = \tau (2/\pi) \operatorname{arcosh}(fe)$

I: $k = a \sqrt{1 - \operatorname{sn}^2 [b_1\, K(k_1), k_1']}$

III: $k = a \Big/ \sqrt{1 - \operatorname{sn}^2 [b_1\, K(k_1), k_1]}$

I: $b_1 = \tau [1 - (2/\pi) \arcsin(fd)]$

III: $b_1 = \tau (2/\pi) \operatorname{arcosh}(fd)$

$0 \le v \le K'(k)$ I: fe, fd < 1 III: fe, fd ≥ 1 $0 \le u \le K(k)$

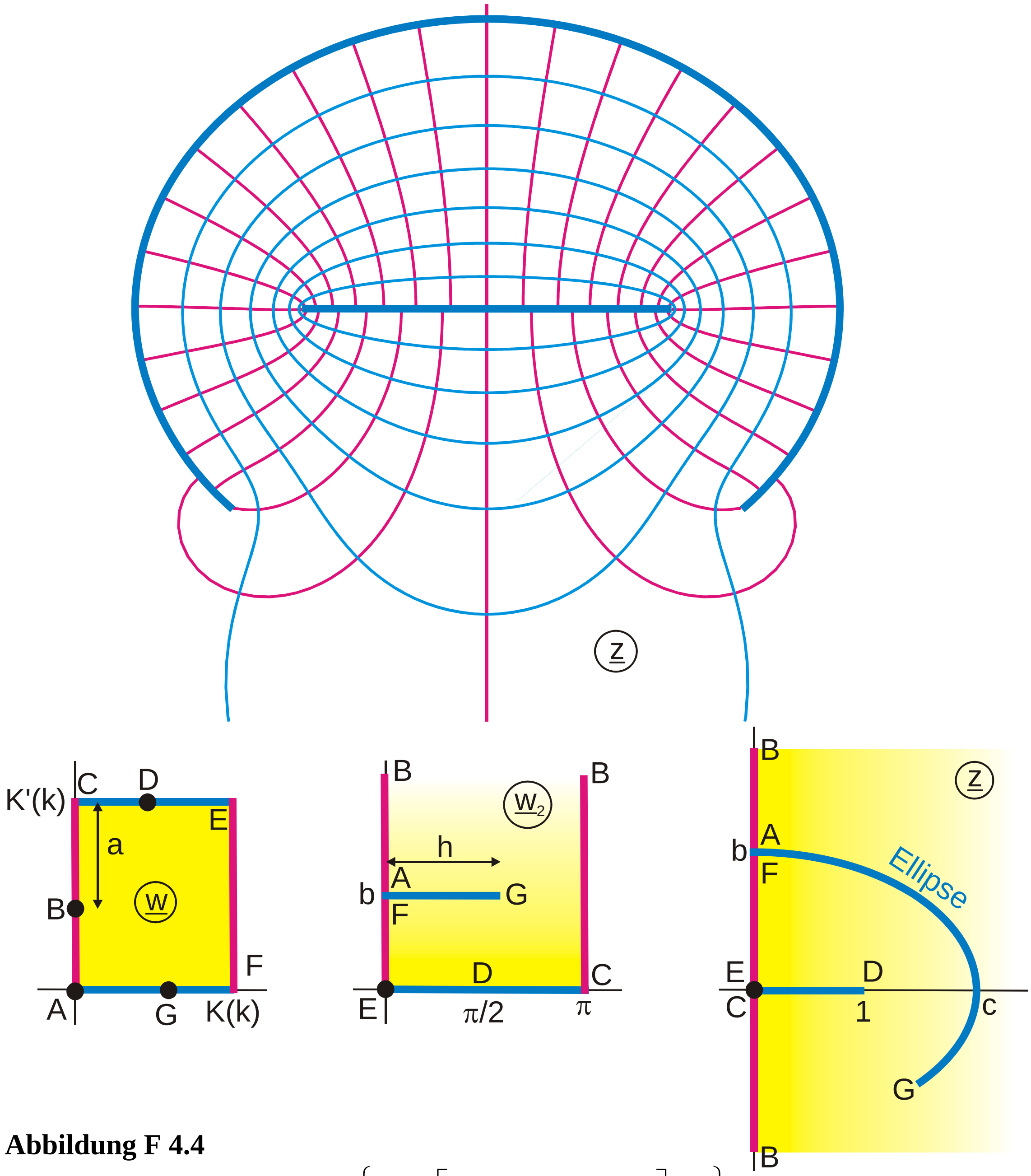


Abbildung F 4.4

$z = \sin w_1$ $\quad$ $w_1 = -j\left\{\ln\dfrac{\vartheta_4\left[\dfrac{\pi}{2K(k)}(w+ja),\tau\right]}{\vartheta_4\left[\dfrac{\pi}{2K(k)}(w-ja),\tau\right]} - b\right\}$ $\quad$ gegeben: b, k

$a = b\dfrac{K(k)}{\pi}$ $\quad$ $0 < a < K'(k)$ $\quad$ $c = \cosh b$

$d = \sinh b$ $\quad$ $\sigma = \dfrac{Z_e(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja)+\mathrm{sn}(ja)\,Z_e(ja)\right]}$ $\quad$ $v_B = K'(k) - a$

$\tau = K'(k)/K(k)$ $\quad$ $h = 2\arg\vartheta_4\left[\dfrac{\pi}{2K(k)}(u_F + ja),\tau\right]$ $\quad$ $u_G = F_a\left(\sqrt{\sigma},k\right)$

$0 \le u \le K(k)$ $\quad$ $0 \le v \le K'(k)$

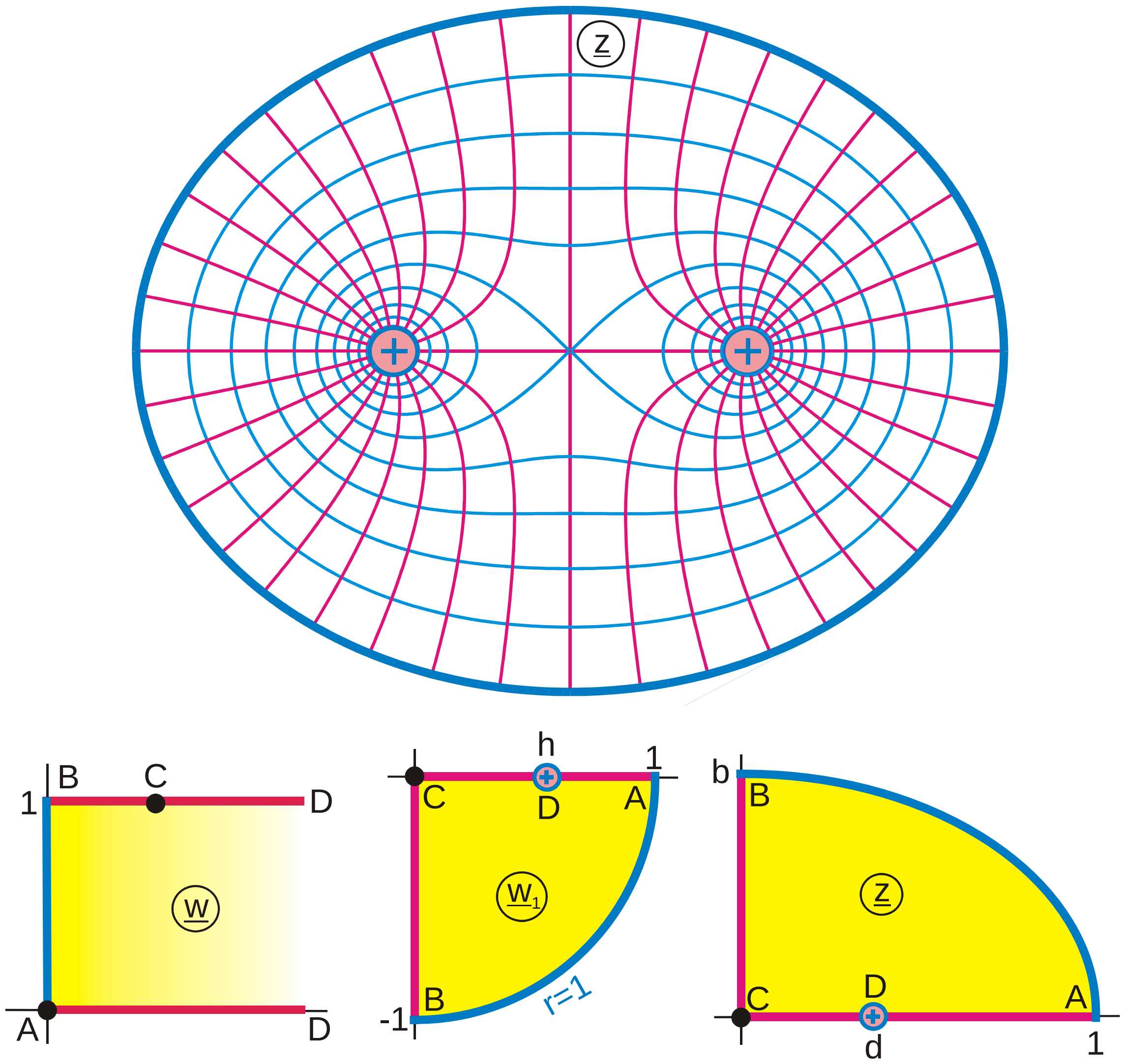


Abbildung F 4.5

$$z = f\sin\left\{\frac{\pi}{2K(k)}F_a\left(\frac{w_1}{\sqrt{k}},k\right)\right\}$$

$$w_1 = \sqrt{\frac{1+\sigma w_0}{\sigma + w_0}}$$

$$w_0 = \exp(\pi w)$$

$$\tau = \frac{4}{\pi} ar\tanh b$$

$$h = \sqrt{k}\,\mathrm{sn}\left\{\frac{2}{\pi}K(k)\arcsin\frac{d}{f},k\right\}$$

$$k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$f = \sqrt{1-b^2}$$

gegeben: b, d

$$\sigma = h^2$$

$$u_C = \frac{1}{\pi}\ln\frac{1}{\sigma}$$

$0 \le u \le 0.9$

$0 \le v \le 1$

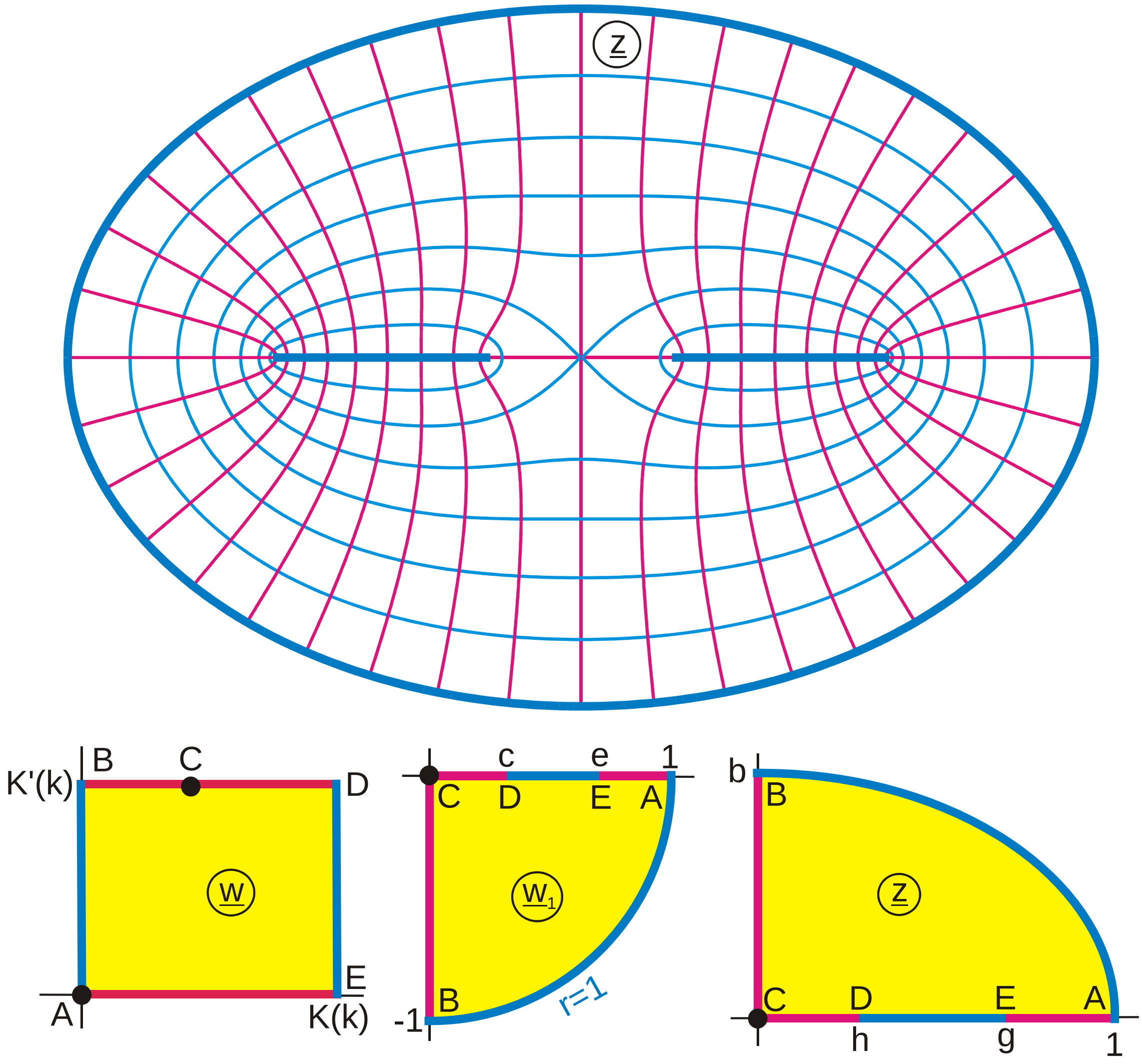


Abbildung F 4.6

$$z = f \sin\left\{\frac{\pi}{2K(k_1)} F_a\left(\frac{w_1}{\sqrt{k_1}}, k_1\right)\right\}$$

$$w_1 = \exp(-w_0)$$

$$w_0 = \operatorname{ar\,tanh}\{ak\,\mathrm{sn}(w,k)\}$$

$$\tau = \frac{4}{\pi} \operatorname{ar\,tanh} b$$

$$e = \sqrt{k_1}\,\mathrm{sn}\left\{\frac{2}{\pi} K(k_1) \arcsin\frac{g}{f}, k_1\right\}$$

$$k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$f = \sqrt{1-b^2}$$

gegeben: b, h, g

a = tanh (-ln c)

k = tanh (-ln e)/a

$$c = \sqrt{k_1}\,\mathrm{sn}\left\{\frac{2}{\pi} K(k_1) \arcsin\frac{h}{f}, k_1\right\}$$

$$u_C = F_a(a,k)$$

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

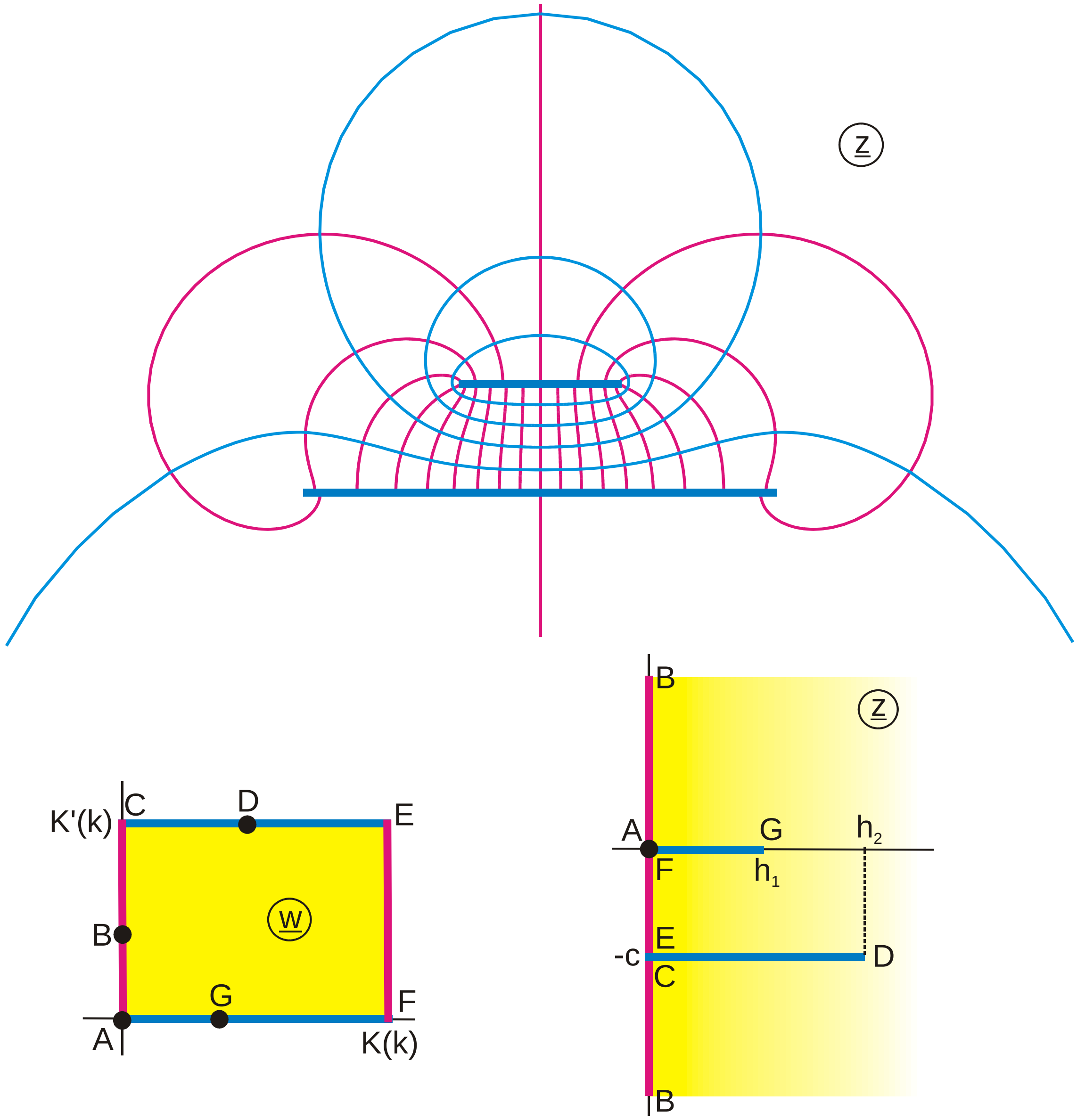


Abbildung F 5

$$z = Z_e(w + j\sigma, k) + Z_e(w - j\sigma, k)$$

$$\sigma = b\frac{K'(k)}{2}$$

$$a = \frac{\pi}{K(k)}$$

$$0 < b < 1$$

$$0 \le v \le K'(k)$$

$$0 \le u \le K(k)$$

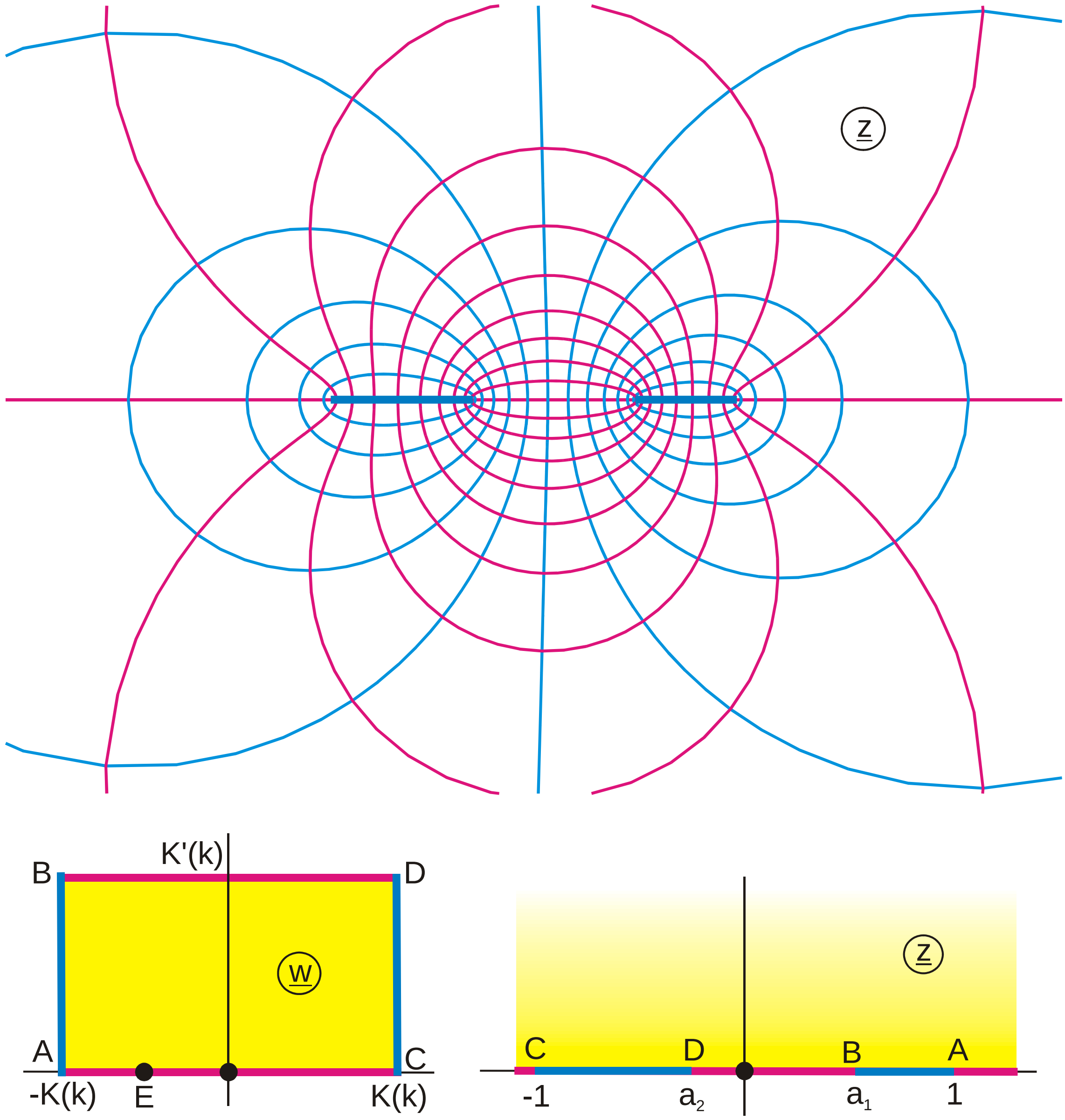


Abbildung F 5.1

$$z = -\frac{k + \sigma\,\mathrm{sn}(w,k)}{\sigma + k\,\mathrm{sn}(w,k)} \qquad \sigma = k\frac{k - a_1}{1 - k a_1}$$

$0 \le |\sigma| \le k$, der kleinere Streifen ist von einer kreisförmigen Potentiallinie umgeben

$$k = \frac{1 - a_1 a_2}{a_1 - a_2} - \sqrt{\left(\frac{1 - a_1 a_2}{a_1 - a_2}\right)^2 - 1} \qquad u_E = F_a\left(-\frac{\sigma}{k}, k\right)$$

$0 \le v \le K'(k)$ $\qquad$ $-K(k) \le u \le K(k)$

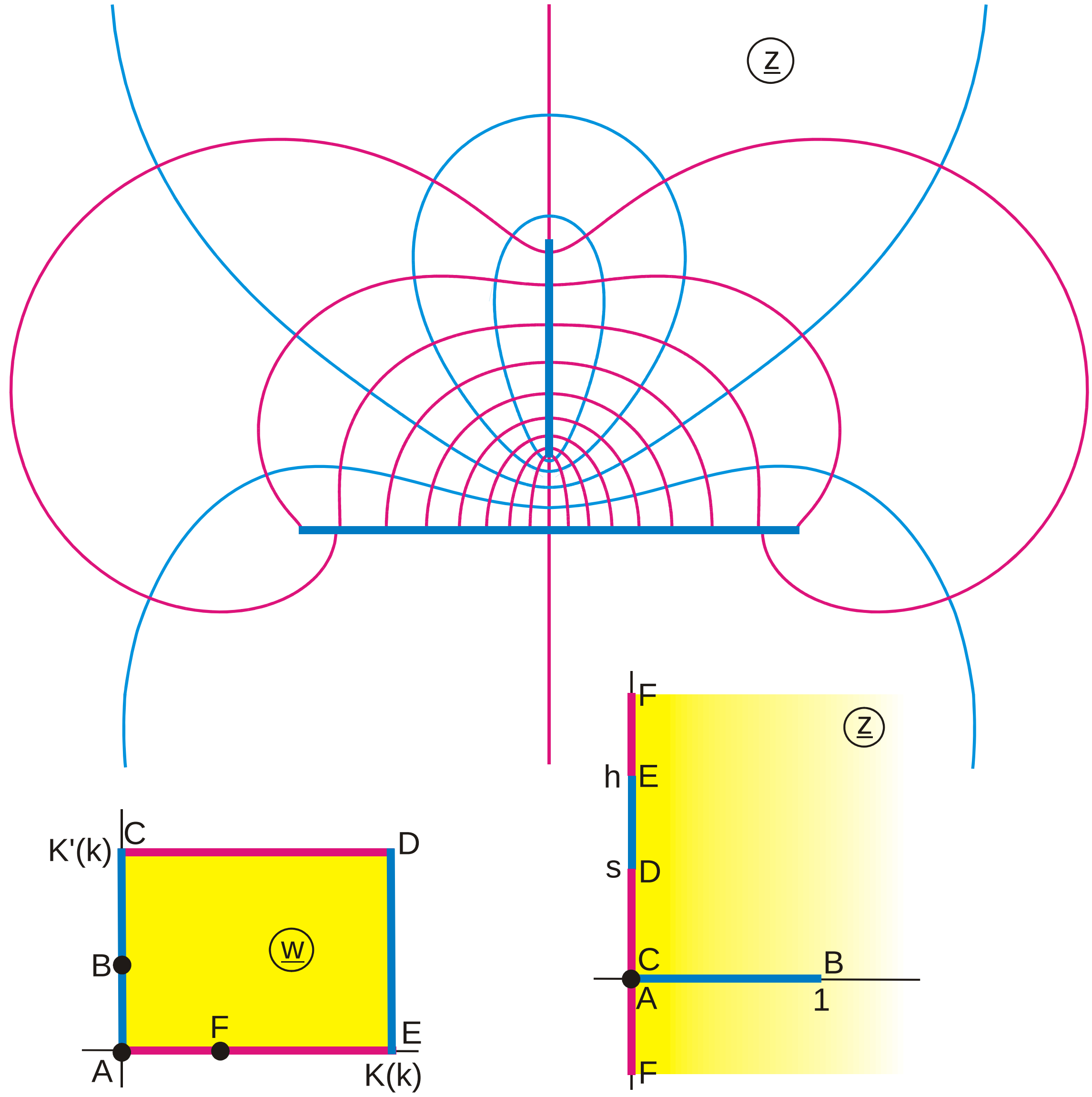


Abbildung F 5.2

$$z = -2\frac{w_1}{1+w_1^{\,2}} \qquad w_1 = j a \operatorname{sn}(w,k)$$

$$a = \frac{1}{h} + \sqrt{1+\left(\frac{1}{h}\right)^2} \qquad d = \frac{a\left(a^2-1\right)}{2a - c\left(a^2-1\right)}$$

$$k = \sqrt{a^2+d^2} - d \qquad u_F = \operatorname{Re} F_a\left(1/a,k\right)$$

$$v_B = \operatorname{Im} F_a\left(j/a,k\right) \qquad c = h - s$$

$$0 \le v \le K'(k) \qquad 0 \le u \le K(k)$$

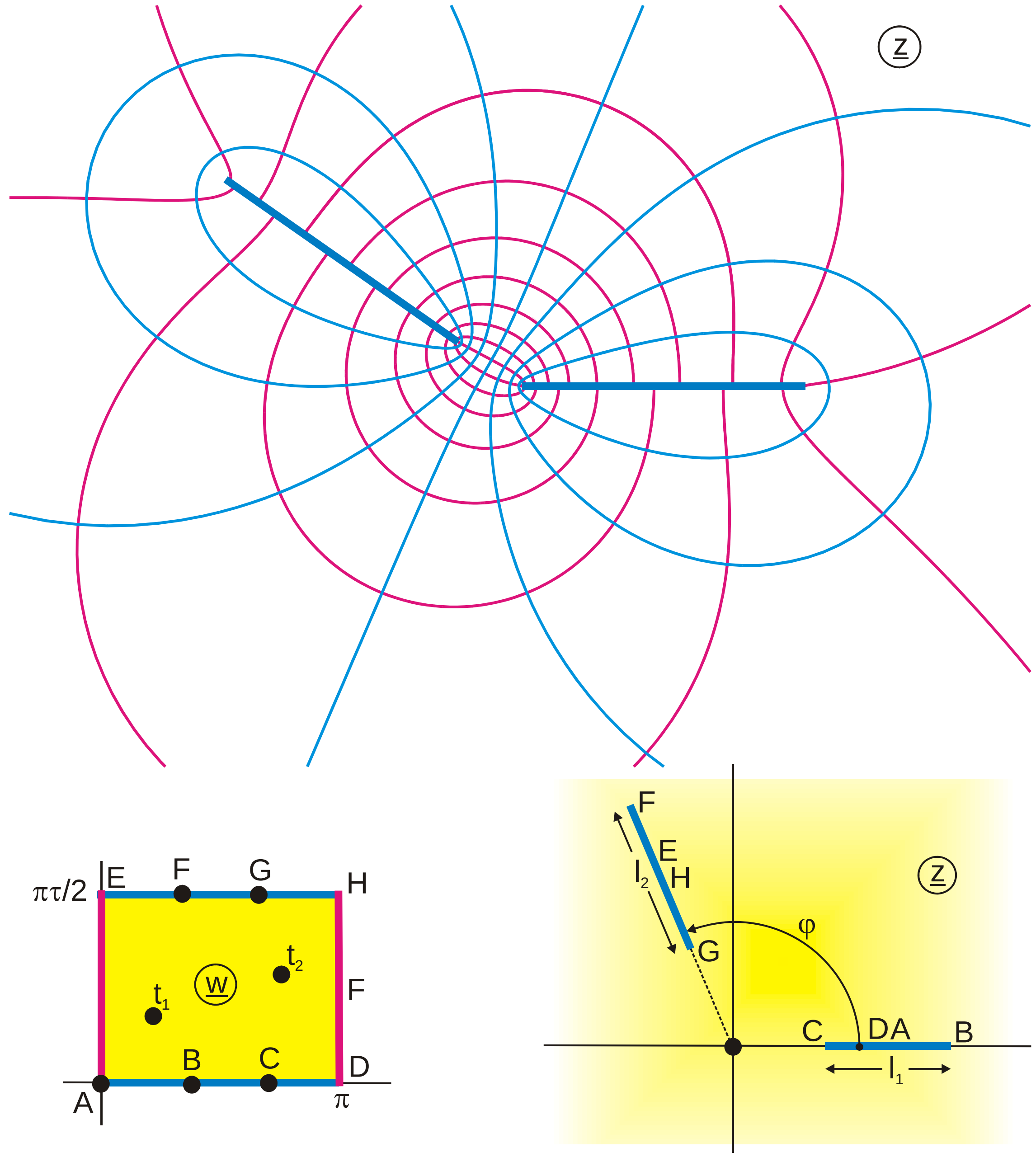
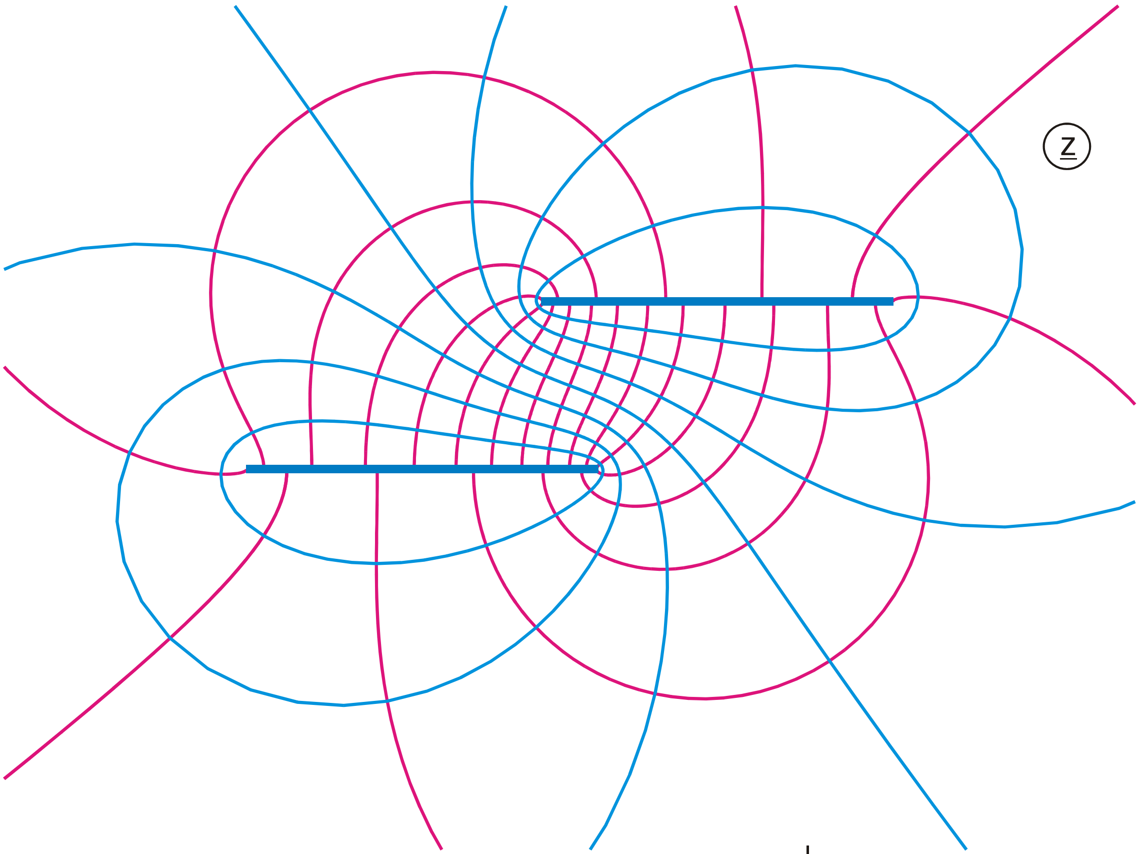


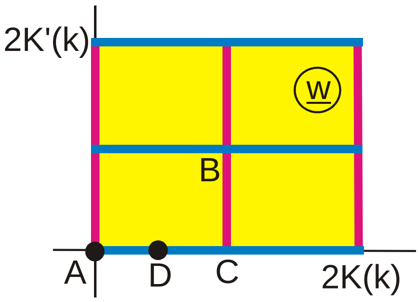
Abbildung F 5.3

$$z = \frac{\vartheta_1\left[\left(w - t_1\right), \tau\right] \vartheta_1\left[\left(w - t_1^*\right), \tau\right]}{\vartheta_1\left[\left(w - t_2\right), \tau\right] \vartheta_1\left[\left(w - t_2^*\right), \tau\right]}$$

$$\varphi = 2\pi\left(\operatorname{Re} t_1 - \operatorname{Re} t_2\right)$$

$0 \le u \le \pi$ $\qquad$ $0 \le v \le \pi\tau/2$





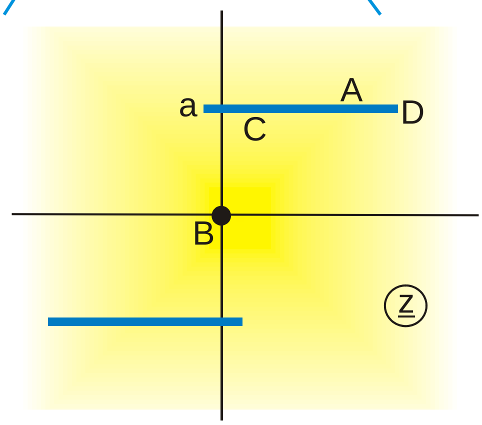
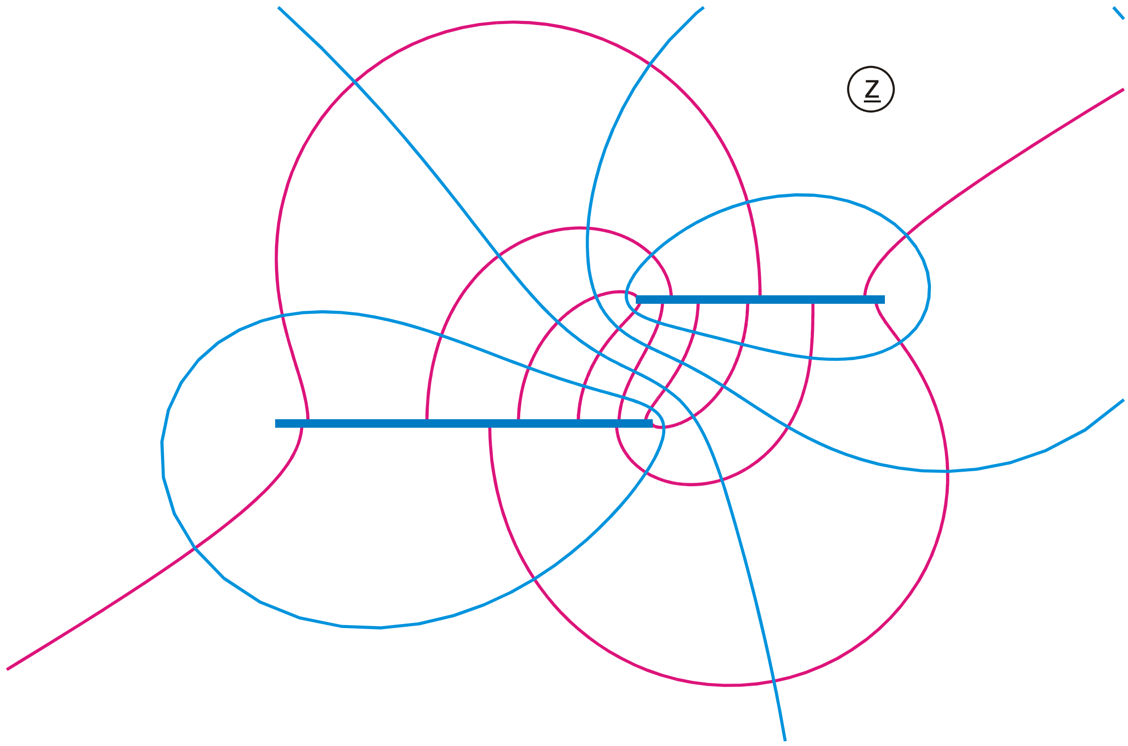


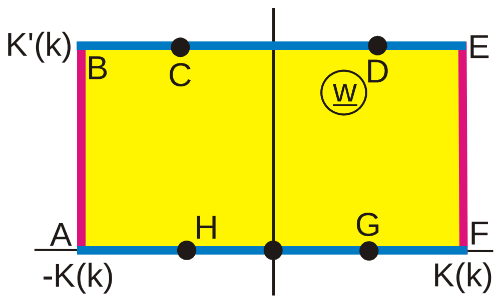
Abbildung F 5.4

$$z = Z_e(w,k) + b\,\mathrm{dn}(w,k) + ja$$

$$a = \frac{\pi}{2K(k)}$$

$0 \le u \le 2K(k)$ $0 \le v \le 2K'(k)$





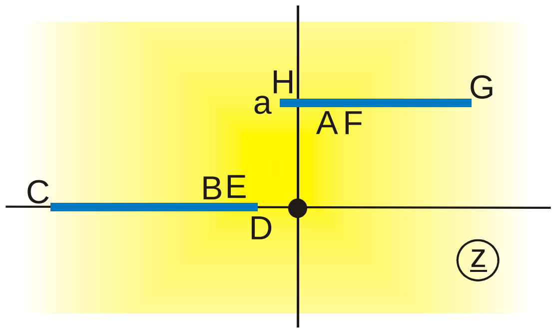


Abbildung F 5.5

$$z = e^{j\varphi}\, Z_e(w - j\sigma, k) + e^{-j\varphi}\, Z_e(w + j\sigma, k) + ja$$

$a = \dfrac{\pi}{2K(k)}$ $\qquad$ $0 < \sigma < K(k)$

$\varphi = 90°$: 2 koplanare Streifen $\qquad$ $\varphi = 0°$: Symmetrie zur y-Achse

$-K(k) \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

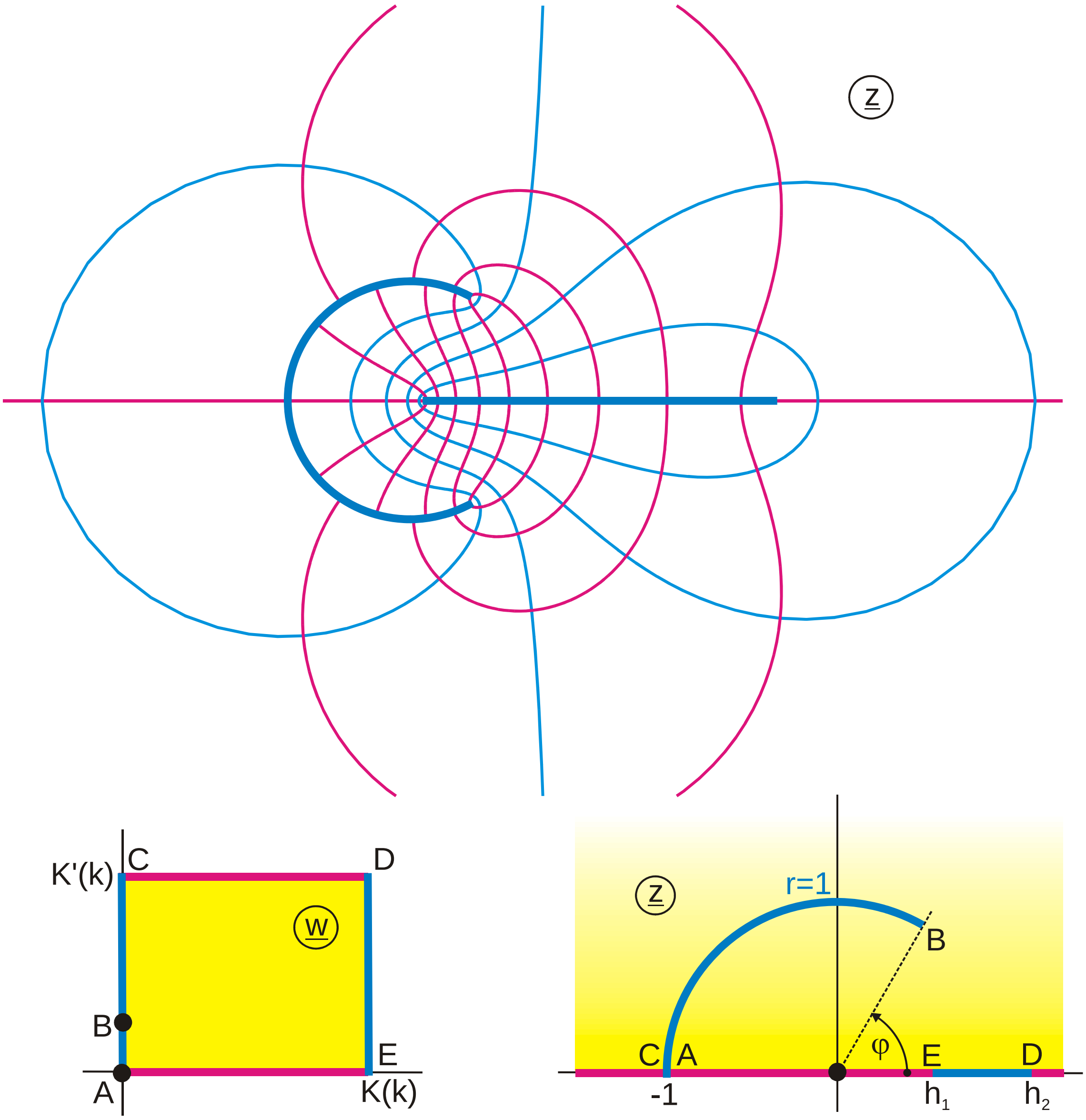


Abbildung F 6

$$z = \frac{w_2 + j}{w_2 - j} \qquad w_2 = -2b\frac{w_1}{1 + w_1^2}$$

$$w_1 = ja\,\mathrm{sn}(w,k) \qquad b = 1/\tan(\varphi/2)$$

$$h = \frac{h_1 + 1}{h_1 - 1} \qquad c = h - \frac{h_2 + 1}{h_2 - 1}$$

$$a = \frac{b}{h} + \sqrt{1 + \left(\frac{b}{h}\right)^2} \qquad d = \frac{ba(a^2 - 1)}{2ba - c(a^2 - 1)}$$

$$k = \sqrt{a^2 + d^2} - d \qquad v_B = \mathrm{Im}\,F_a(j/a, k)$$

$$0 \le v \le K'(k) \qquad 0 \le u \le K(k)$$

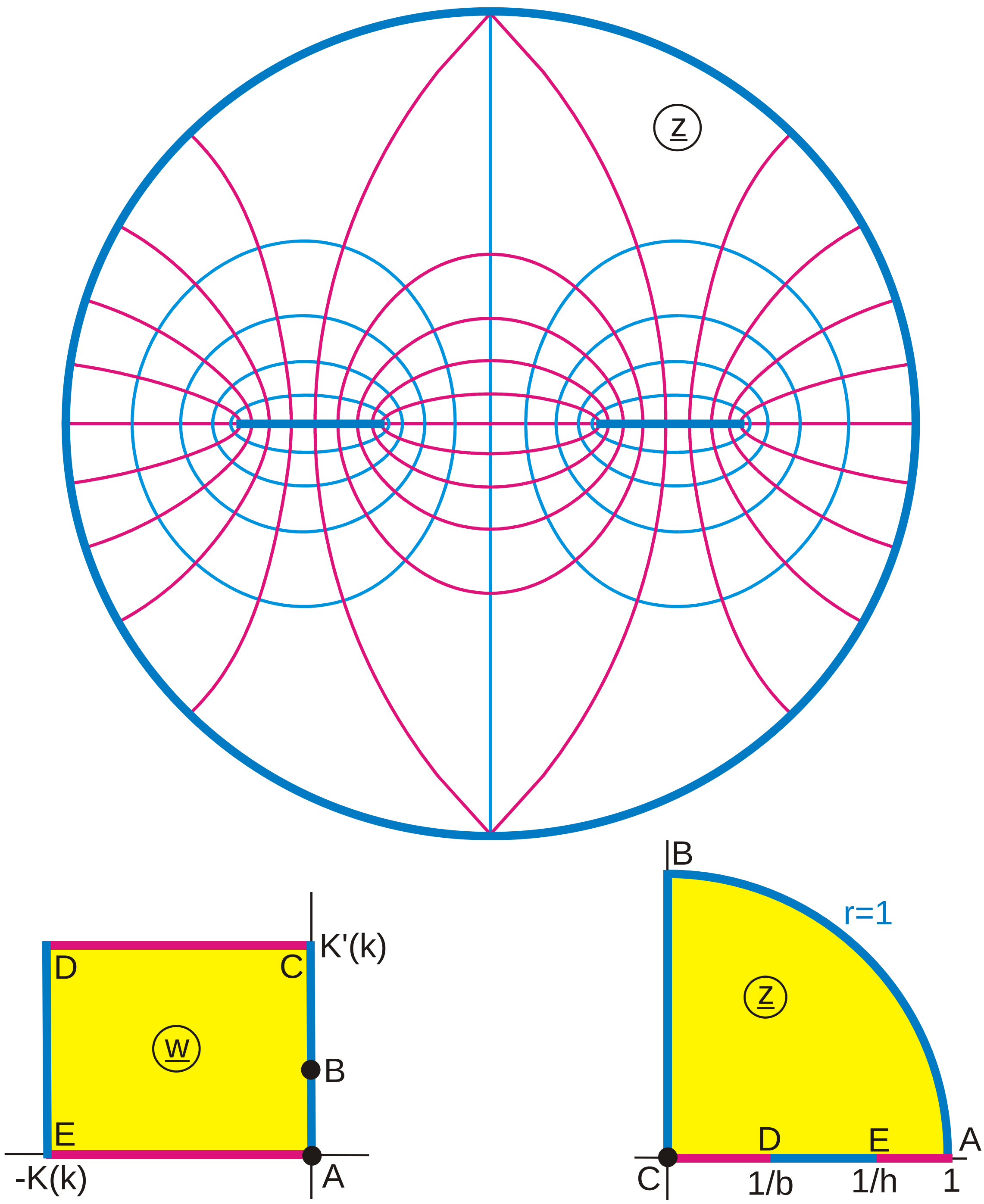


Abbildung F 6.1

$z = w_1 + \sqrt{w_1^{\,2} + 1}$

$a = \dfrac{h - 1/h}{2}$

$v_B = \operatorname{Im} F_a\left(j/a, k\right)$

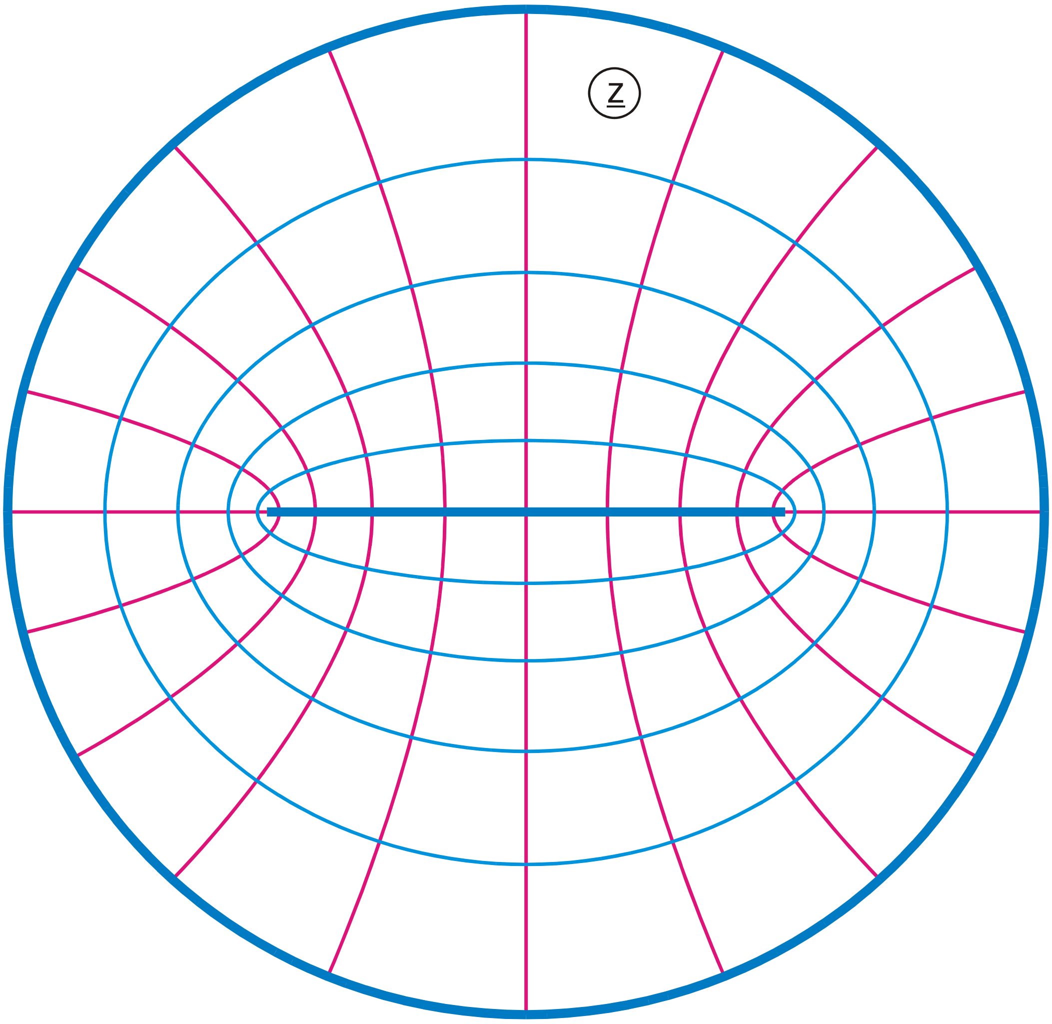
$0 \le v \le K'(k)$

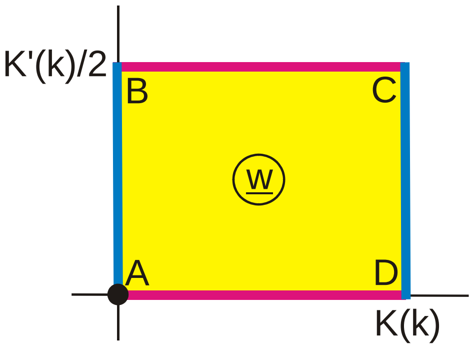
$w_1 = a\,\mathrm{sn}\left(w, k\right)$

$k = \dfrac{2a}{b - 1/b}$

Kreisinneres von Abb. K 3.5

$-K(k) \le u \le 0$





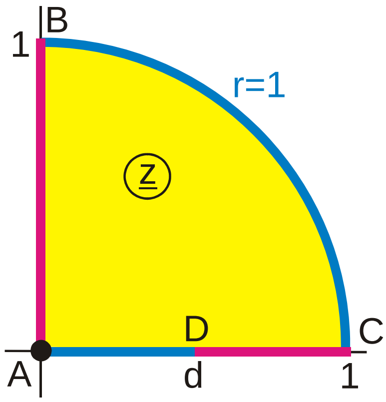
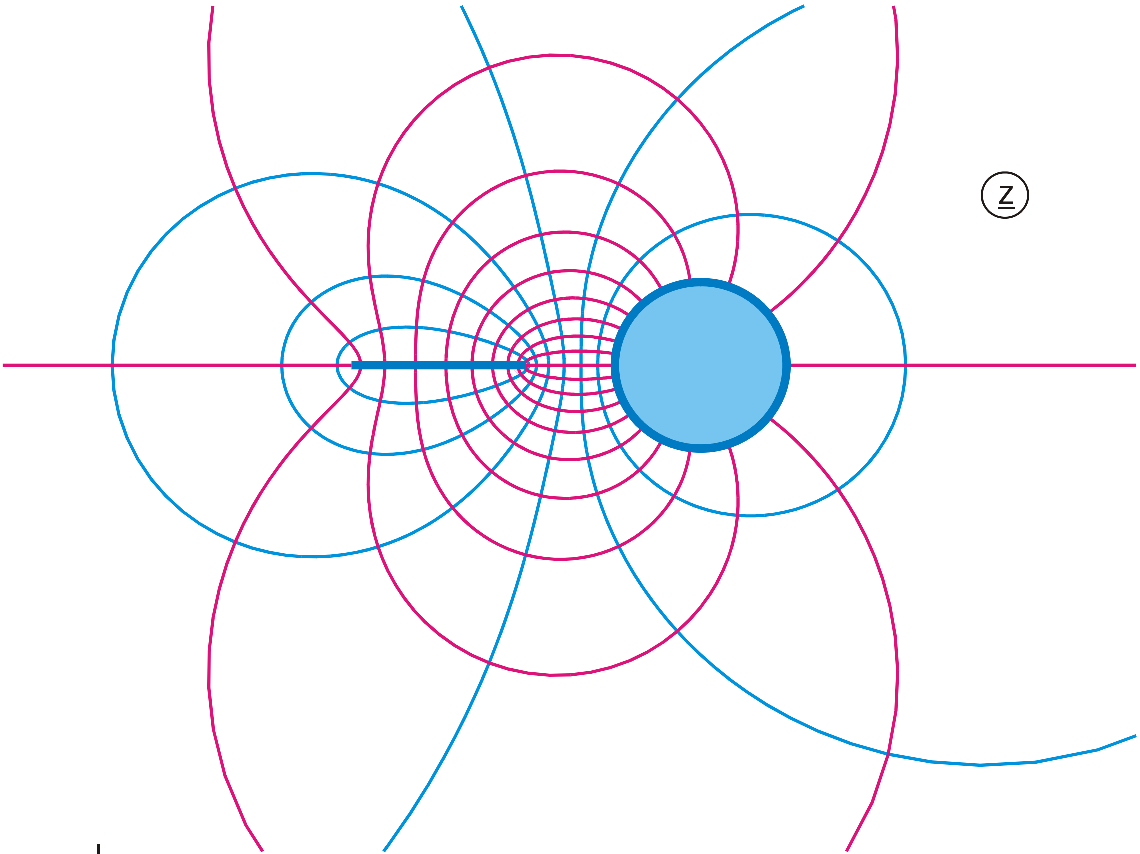


Abbildung F 6.2

$z = \sqrt{k}\,\mathrm{sn}(w,k)$ $\qquad k = d^2$

$0 \le v \le K'(k)/2$ $\qquad 0 \le u \le K(k)$



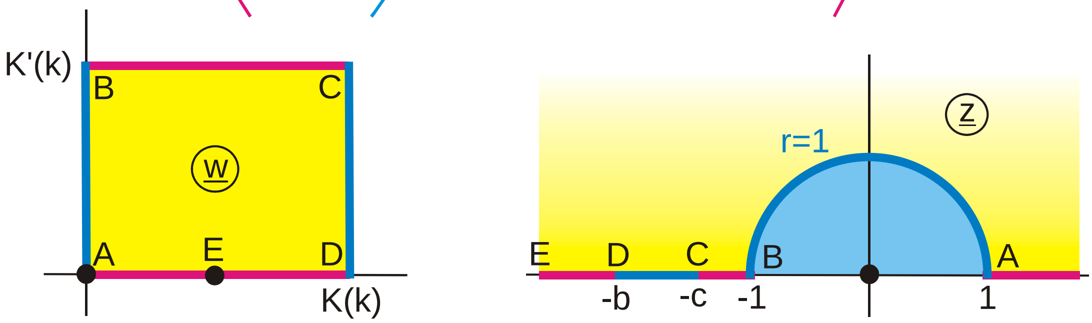


Abbildung F 6.3

$$z = \frac{1 + a\,\mathrm{sn}(w,k)}{1 - a\,\mathrm{sn}(w,k)}$$

$$k = a\frac{c-1}{c+1}$$

$$a = \frac{b+1}{b-1}$$

$$u_E = \mathrm{Re}\,F_a(1/a, k)$$

$0 \le v \le K'(k)$

$0 \le u \le K(k)$

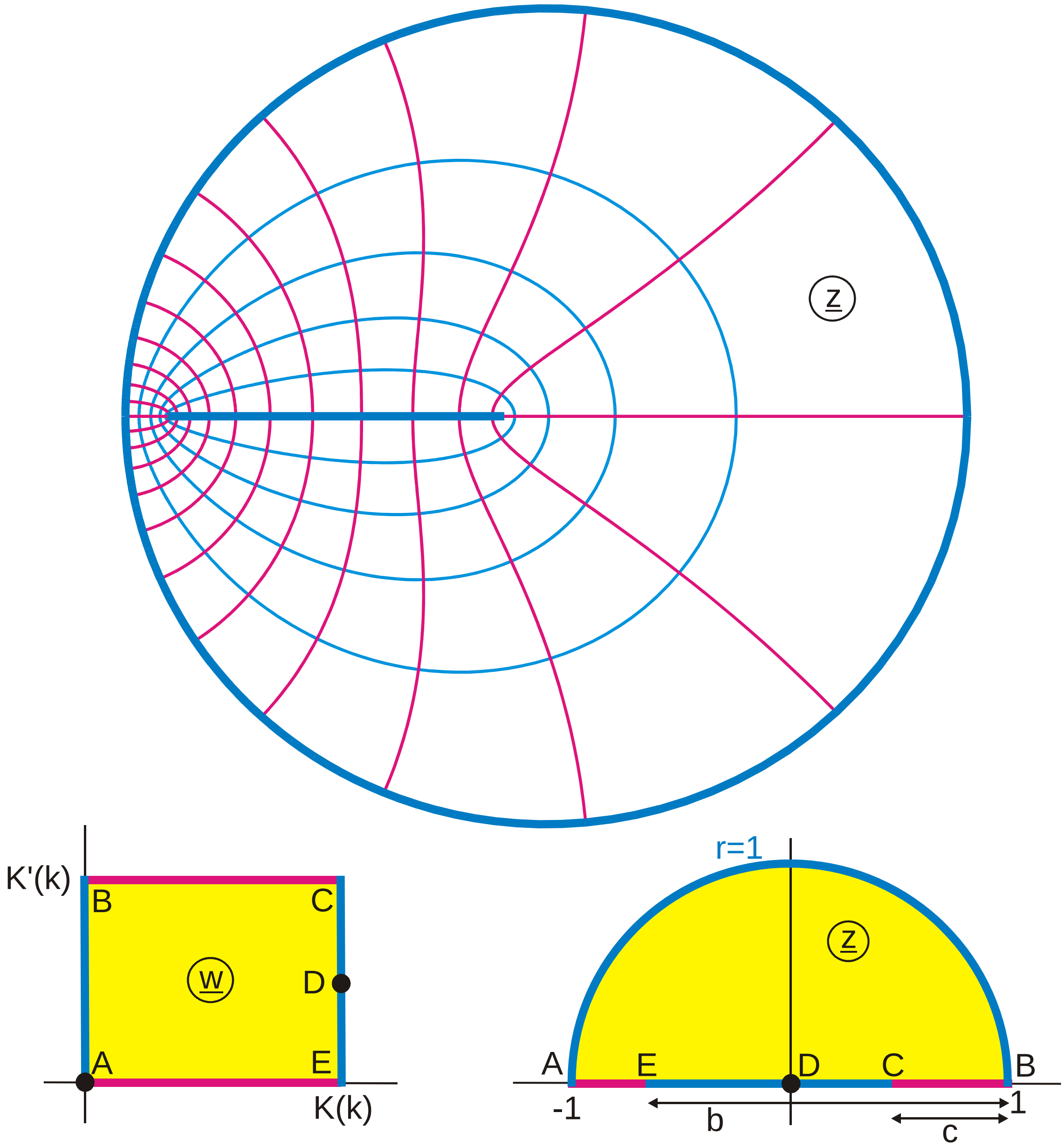


Abbildung F 6.4

$$z = \frac{a\,\mathrm{sn}(w,k) - 1}{a\,\mathrm{sn}(w,k) + 1}$$

$$a = \frac{2}{b} - 1$$

$$c = \frac{2}{1 + a/k}$$

$$0 \le v \le K'(k)$$

$$k = \frac{ac}{2 - c}$$

$$v_D = \operatorname{Im} F_a(1/a, k)$$

$$b = \frac{2}{1 + a}$$

$$0 \le u \le K(k)$$

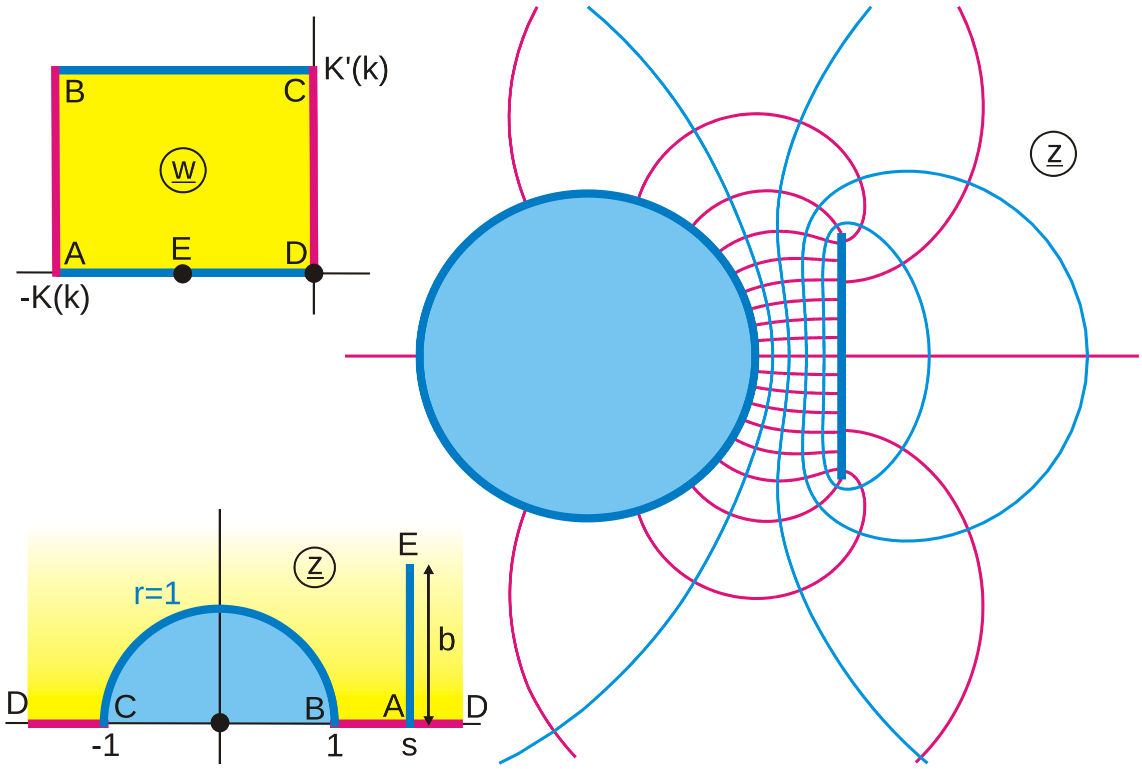


Abbildung F 6.5

$$z = \frac{1}{\rho w_1} + r$$

$$w_1 = r\left\{1 + \frac{\vartheta_4\left[\frac{\pi}{2K(k)}\left(w + ja\right), \tau\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}\left(w - ja\right), \tau\right]}\right\}$$

$$r = s - \sqrt{s^2 - 1}$$

$$\sigma = \frac{Z\left(ja, k\right)}{k^2\, \mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja) + \mathrm{sn}(ja) Z(ja, k)\right]}$$

$$a = -\ln r \frac{K(k)}{\pi}$$

$$u_E = -F_a\left(\sqrt{\sigma}, k\right)$$

$$\varphi = 2 \arg \vartheta_4\left[\frac{\pi}{2K(k)}\left(-u_E + ja\right), \tau\right]$$

$$\rho = \frac{1}{1 - r^2}$$

$$0 < a < K'(k)$$

$$\tau = \frac{K'(k)}{K(k)}$$

$$b = \frac{1}{\rho} \mathrm{Im}\left\{\frac{1}{r + r\exp(-j\varphi)}\right\}$$

gegeben: s, k

$-K(k) \le u \le 0$

$0 \le v \le K'(k)$

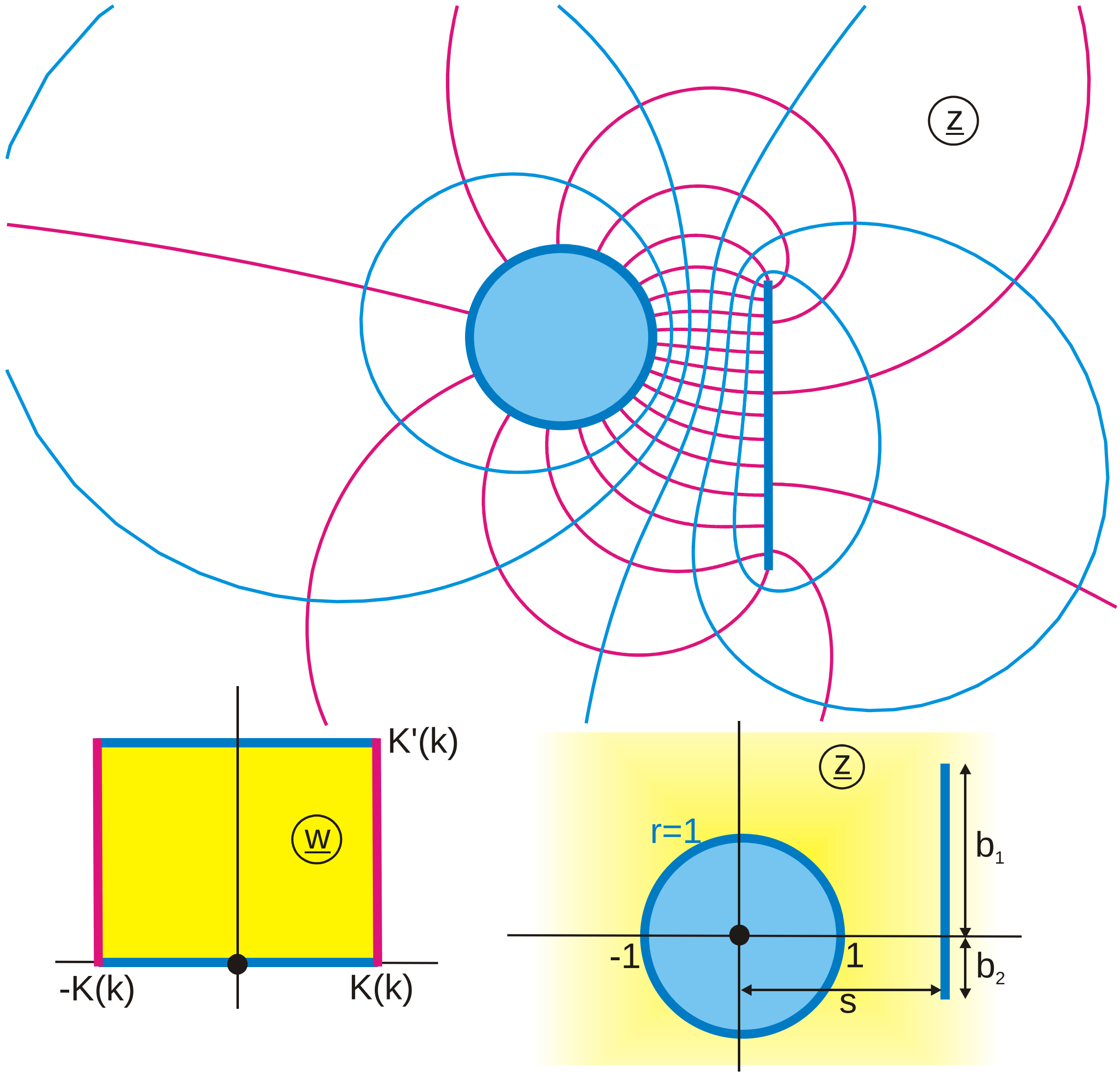


Abbildung F 6.6

$$z = \frac{1}{\rho w_1} + r \qquad w_1 = r\left\{1 + \exp(j\beta)\frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w+ja),\tau\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w-ja),\tau\right]}\right\}$$

$$r = s - \sqrt{s^2 - 1} \qquad \sigma = \frac{Z(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja) + \mathrm{sn}(ja)Z(ja,k)\right]}$$

$$a = -\ln r\,\frac{K(k)}{\pi} \qquad \rho = \frac{1}{1-r^2} \qquad u_E = -F_a\left(\sqrt{\sigma},k\right)$$

$$\varphi = 2\arg\vartheta_4\left[\frac{\pi}{2K(k)}(-u_E + ja),\tau\right] \qquad 0 < a < K'(k) \qquad \tau = \frac{K'(k)}{K(k)}$$

$$b_1 = \frac{1}{\rho}\,\mathrm{Im}\left\{\frac{1}{r + r\exp(-j[\varphi-\beta])}\right\} \qquad b_2 = \frac{1}{\rho}\,\mathrm{Im}\left\{\frac{1}{r + r\exp(-j[\varphi+\beta])}\right\}$$

gegeben: s, β, k $\qquad -K(k) \le u \le 0 \qquad 0 \le v \le K'(k)$

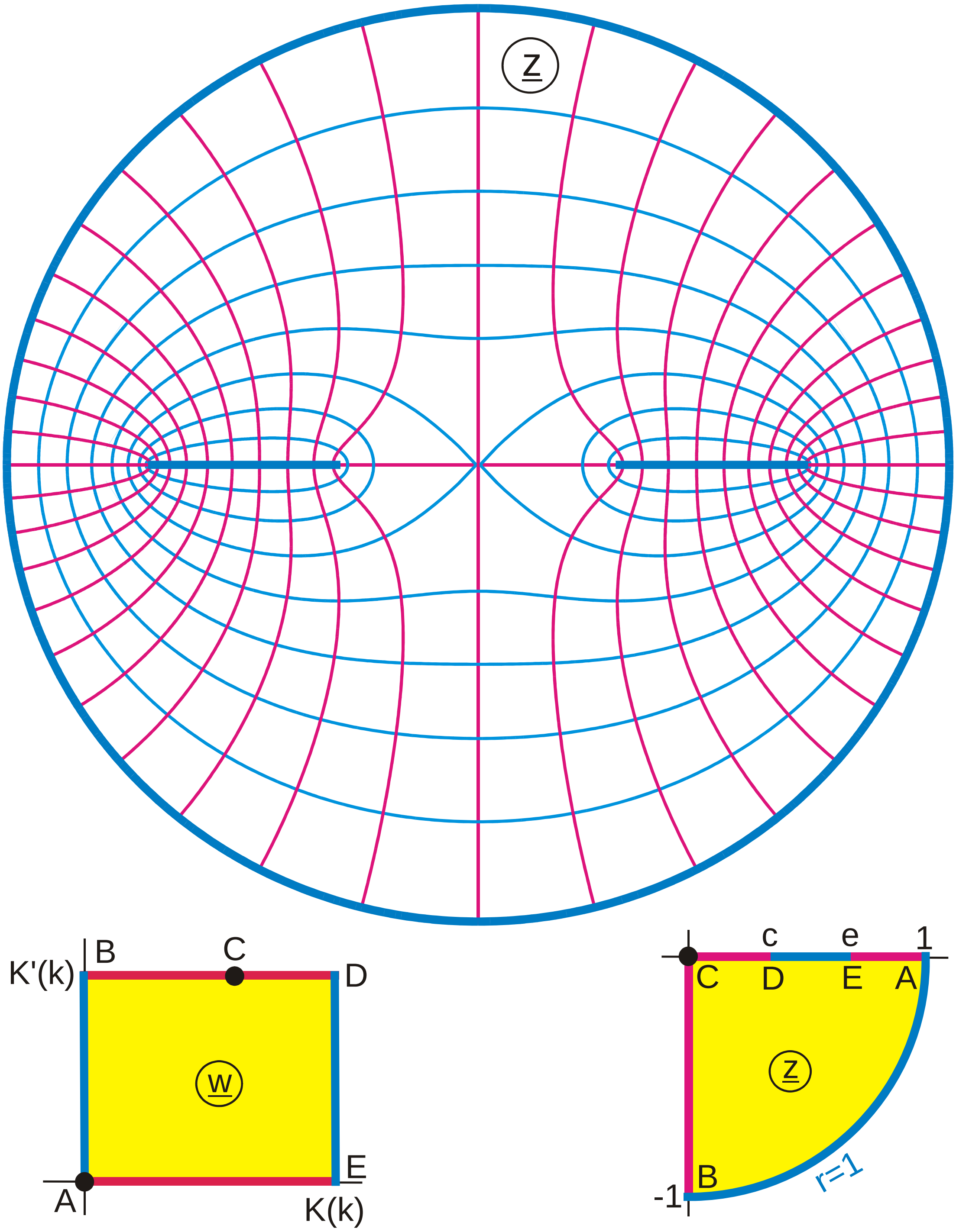


Abbildung F 6.7

$z = \exp(-w_1)$

$w_1 = \operatorname{ar\,tanh}\{ak\,\operatorname{sn}(w,k)\}$

a = tanh (-ln c)

k = tanh (-ln e)/a

$u_C = F_a(a,k)$

gegeben: c, e

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

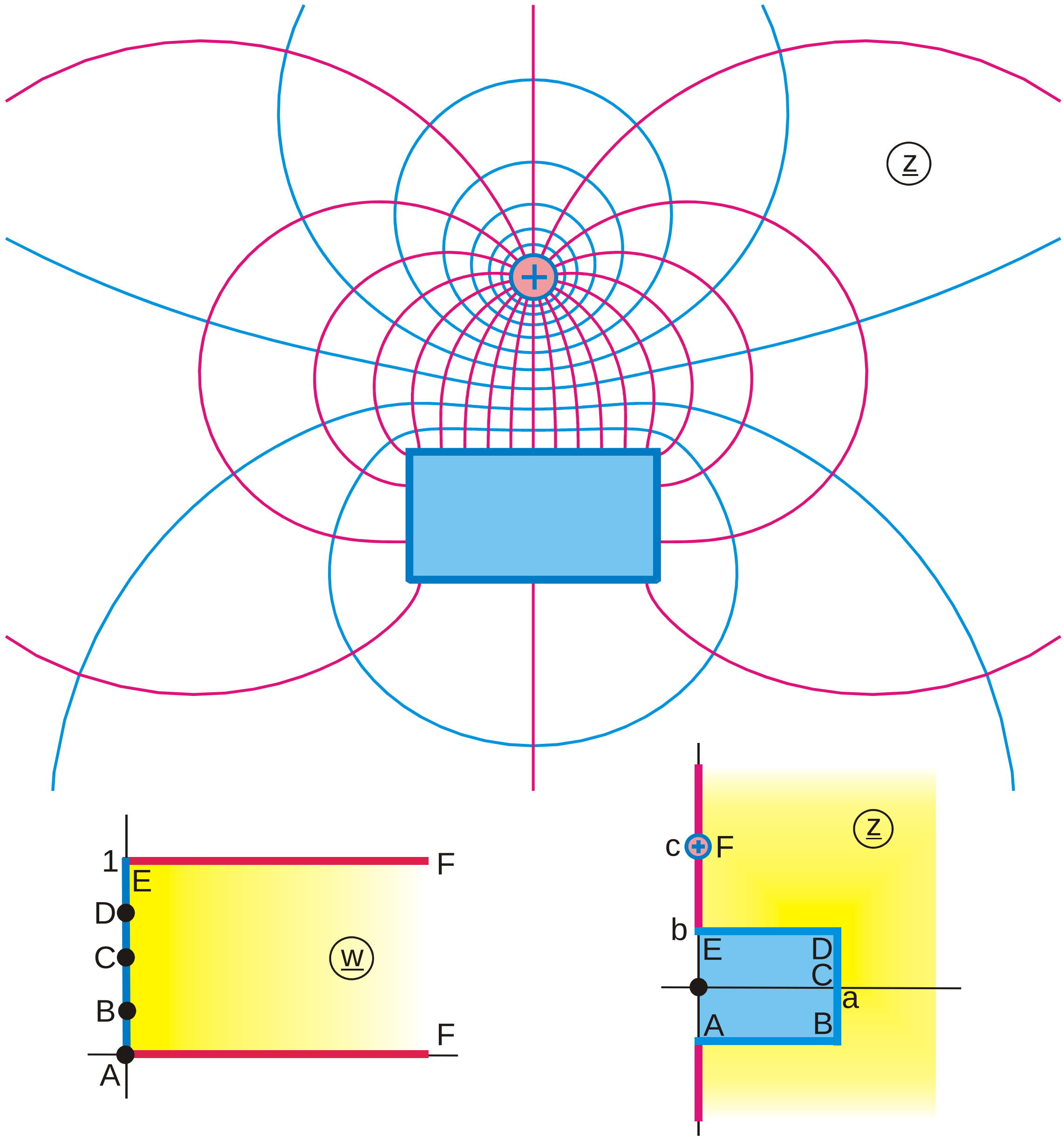


Abbildung F 7

$$z = B_a\left(\frac{w_2}{k}, k\right) + jb$$

$$h = \frac{2\sigma}{1-\sigma^2}$$

$$w_2 = -2\frac{w_1}{1+w_1^2}$$

$$w_1 = j\sigma\frac{1+\exp(w\pi)}{1-\exp(w\pi)}$$

$$c = \mathrm{Im}\left\{B_a\left(j\frac{h}{k}, k\right)\right\} + b$$

gegeben: k, σ

$$a = \frac{E(k) - k'^2 K(k)}{k^2}$$

$$b = \frac{E'(k)}{k^2} - K'(k)$$

$0 \le u \le 1$

$0 \le v \le 1$

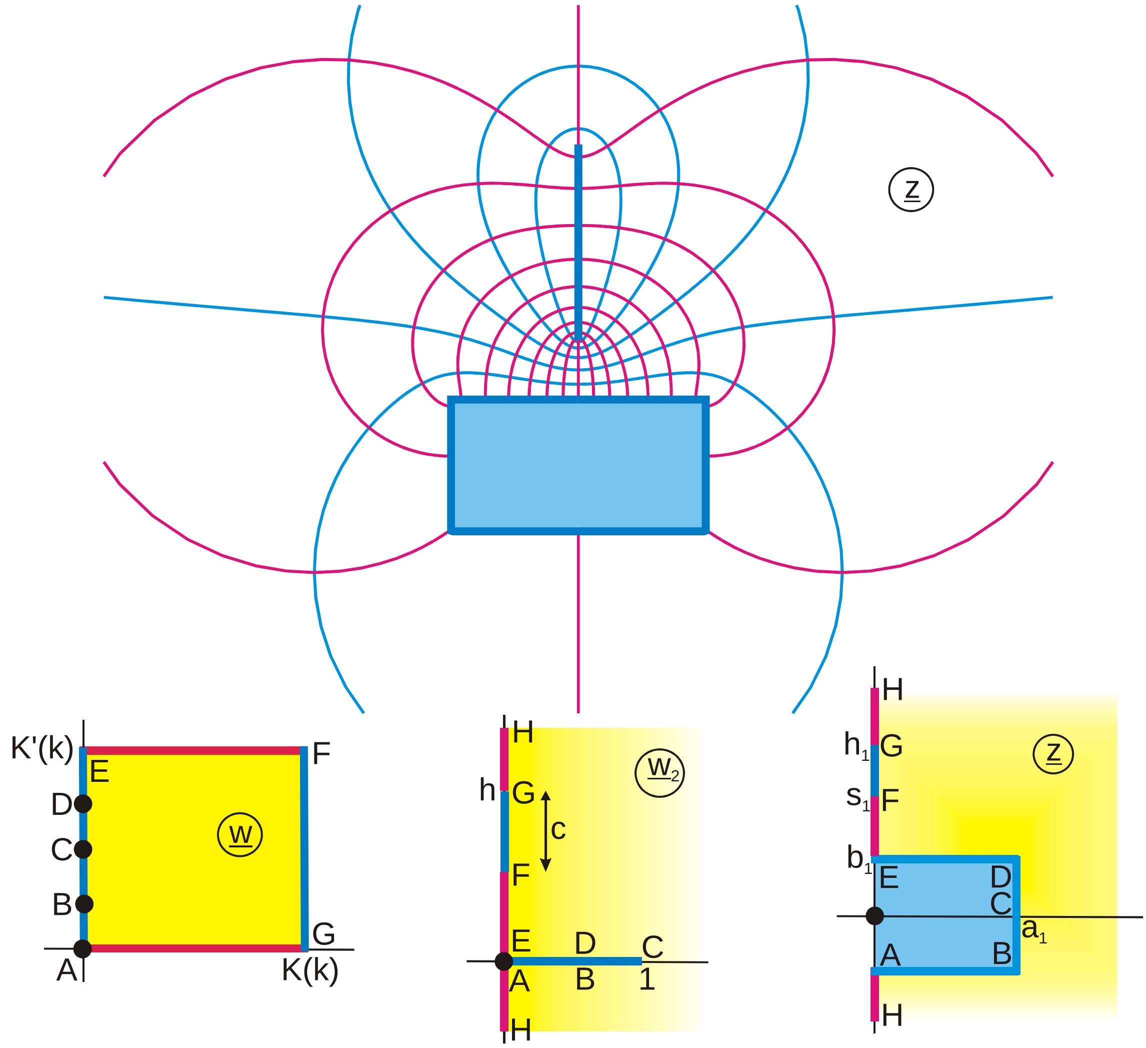


Abbildung F 7.1

$$z = B_a\left(\frac{w_2}{k_1}, k_1\right) + jb_1$$

$$h = \frac{2\sigma}{1-\sigma^2}$$

$$w_2 = -2\frac{w_1}{1+w_1{}^2}$$

$$w_1 = ja\,\mathrm{sn}(w,k)$$

$$h_1 = \mathrm{Im}\left\{B_a\left(j\frac{h}{k_1}, k_1\right)\right\} + b_1$$

$$s_1 = \mathrm{Im}\left\{B_a\left(j\frac{h-c}{k_1}, k_1\right)\right\} + b_1$$

$$a_1 = \frac{E(k_1) - k_1{}'^2\,K(k_1)}{k_1{}^2}$$

$$b_1 = \frac{E'(k_1)}{k_1{}^2} - K'(k_1)$$

$$a = \frac{1}{h} + \sqrt{1+\left(\frac{1}{h}\right)^2}$$

$$d = \frac{a\left(a^2-1\right)}{2a - c\left(a^2-1\right)}$$

$$k = \sqrt{a^2 + d^2} - d$$

$$u_H = \mathrm{Re}\,F_a\left(1/a, k\right)$$

$$v_C = \mathrm{Im}\,F_a\left(j/a, k\right)$$

gegeben: k_1, c, h

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

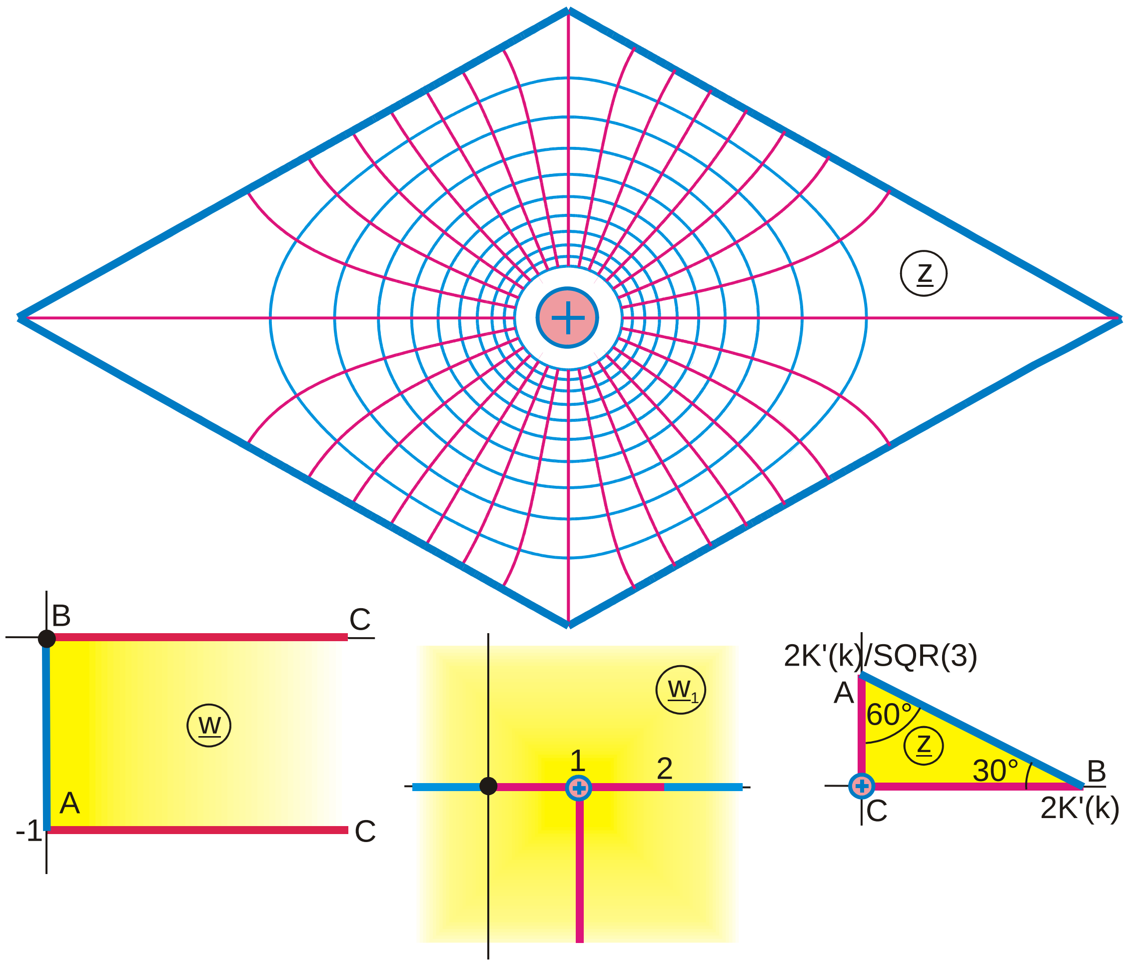


Abbildung F 8

$$z = jF_t\left(\arccos w_3, k\right) \qquad w_3 = \frac{\sqrt{3} - 1 + \sqrt[3]{w_2 - 1}}{\sqrt{3} + 1 - \sqrt[3]{w_2 - 1}}$$

$$w_2 = \frac{2}{w_1} \qquad w_1 = 1 - \frac{1}{\cosh(w\pi)}$$

$$k = \sqrt{\frac{2 + \sqrt{3}}{4}} = 0{,}966$$

$0 \le u \le 1{,}1$ $\qquad$ $-1 \le v \le 0$

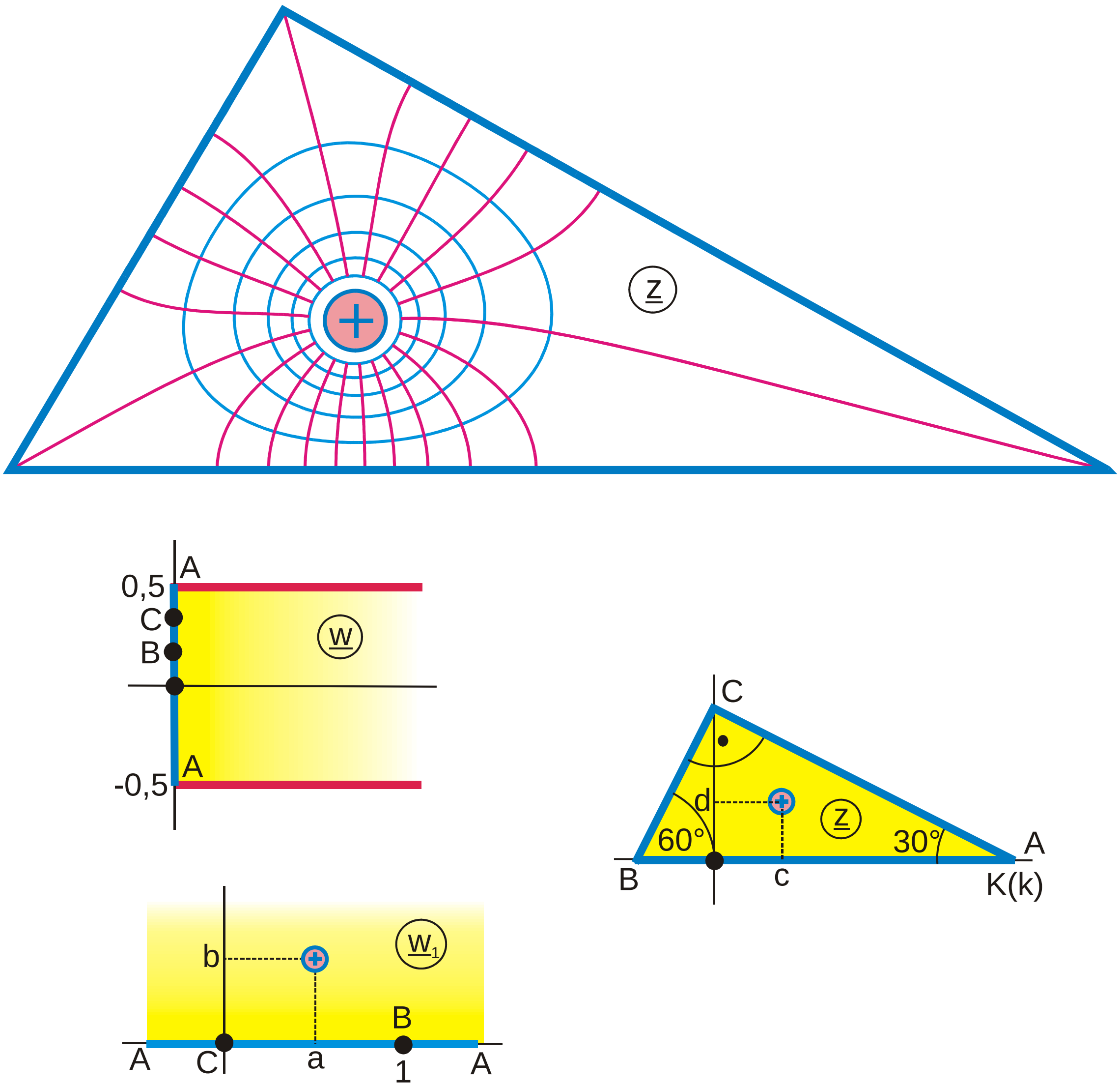


Abbildung F 8.1

$$z = F_t\left(w_3, k\right) - K(k)$$

$$w_2 = \frac{\sqrt{3} - 1 - \sqrt[3]{w_1 - 1}}{\sqrt{3} + 1 + \sqrt[3]{w_1 - 1}}$$

$$w_3 = \arccos w_2$$

$$w_1 = a + jb\tanh(w\pi)$$

$$k = \sqrt{\frac{2 + \sqrt{3}}{4}} = 0{,}966$$

$0 \leq u \leq 0{,}25$

$-0{,}5 \leq v \leq 0{,}5$

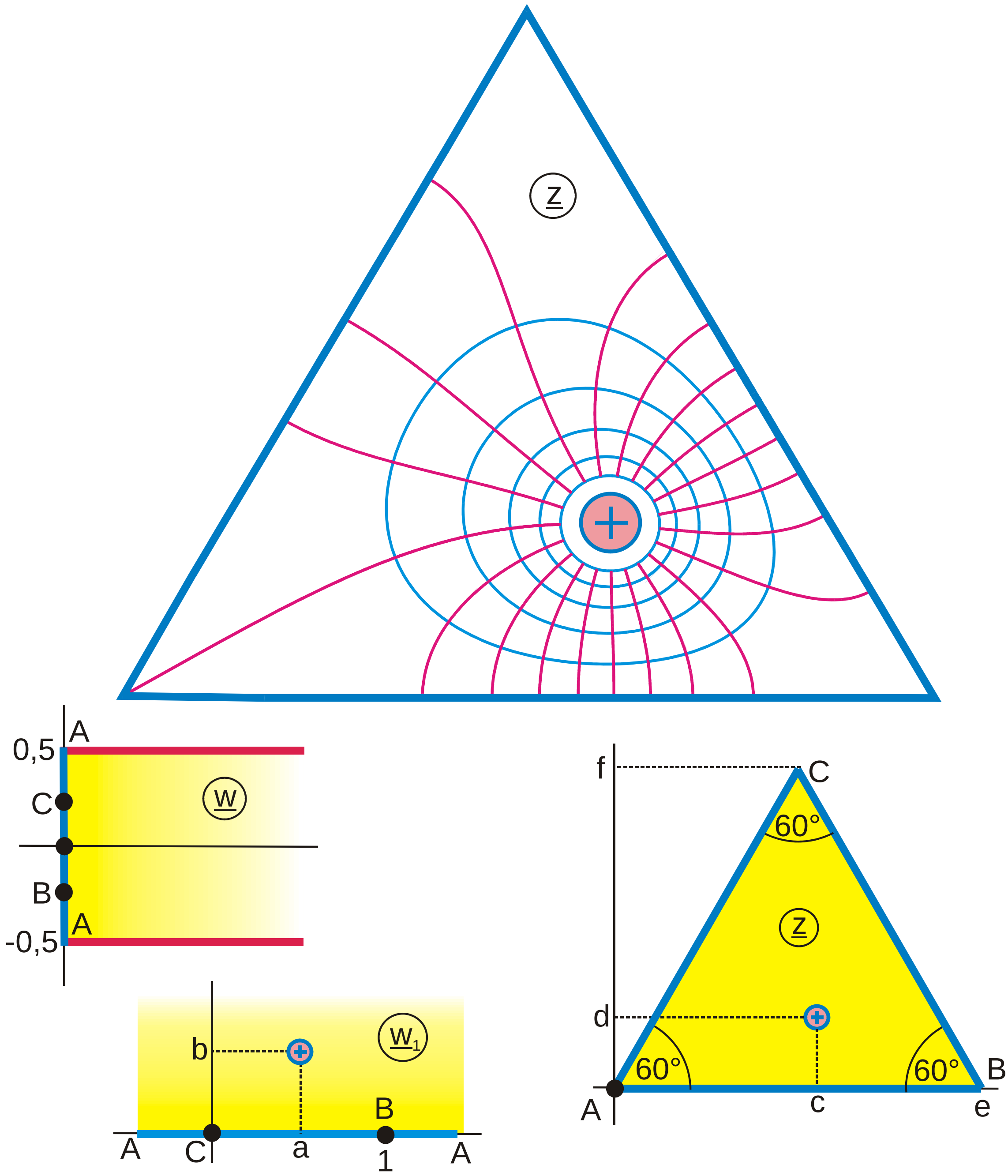


Abbildung F 8.2

$z = F_t(w_3, k)$

$$w_2 = \frac{\sqrt{3} - 1 - \sqrt[3]{w_1^{\,2} - 1}}{\sqrt{3} + 1 + \sqrt[3]{w_1^{\,2} - 1}}$$

$w_3 = \arccos w_2$

$w_1 = a + jb \tanh(w\pi)$

$k = \sqrt{\dfrac{2+\sqrt{3}}{4}} = 0{,}966$ gegeben: a, b $f = K'(k) / \cos 30°$

$0 \le u \le 0{,}25$ $-0{,}5 \le v \le 0{,}5$ $e = K(k) + K'(k) / \sqrt{3}$

Für b = 1 und a = 0 bzw. 0,5 befindet sich die Linienladung auf der Mittelsenkrechten.

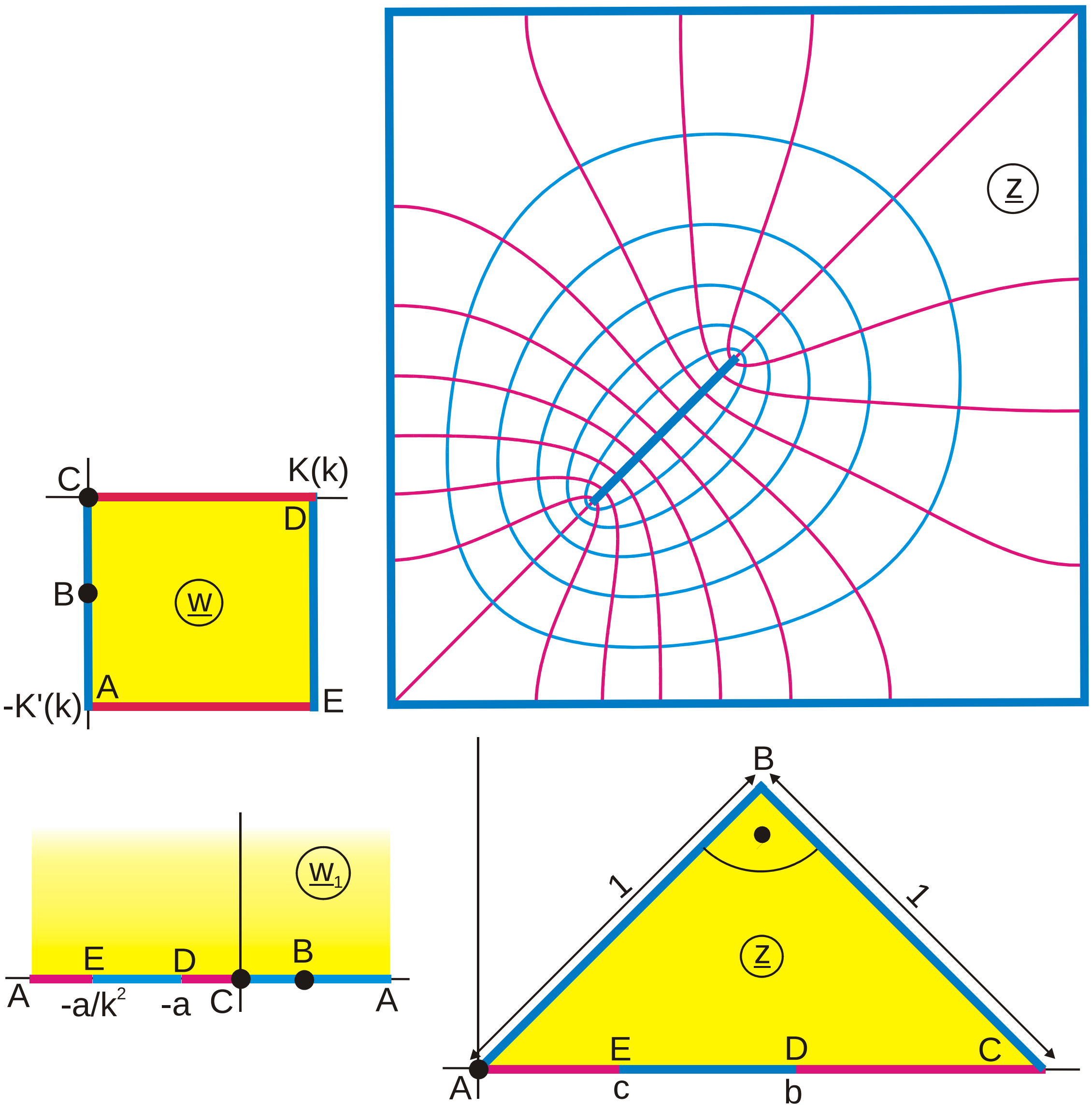


Abbildung F 8.3

$z = \exp(j3\pi/4)\left\{F_t\left(w_3, k_1\right)/K(k_1) - 1\right\}$

$w_2 = \dfrac{1}{\sqrt[4]{w_1}}$

$w_3 = \arccos w_2$

$w_1 = -a\,\mathrm{sn}^2(w, k)$

$k_1 = 1/\sqrt{2}$

gegeben: a, k

$b = \dfrac{|K(k) - d|}{K(k)}$

$d = F_t\left[\arccos\left(\dfrac{1}{\sqrt[4]{-a}}\right), k_1\right]$

$c = \sqrt{2} - \dfrac{|K(k) - e|}{K(k)}$

$e = F_t\left[\arccos\left(\dfrac{1}{\sqrt[4]{-a/k^2}}\right), k_1\right]$

$0 \le u \le 0{,}25$

$-0{,}5 \le v \le 0{,}5$

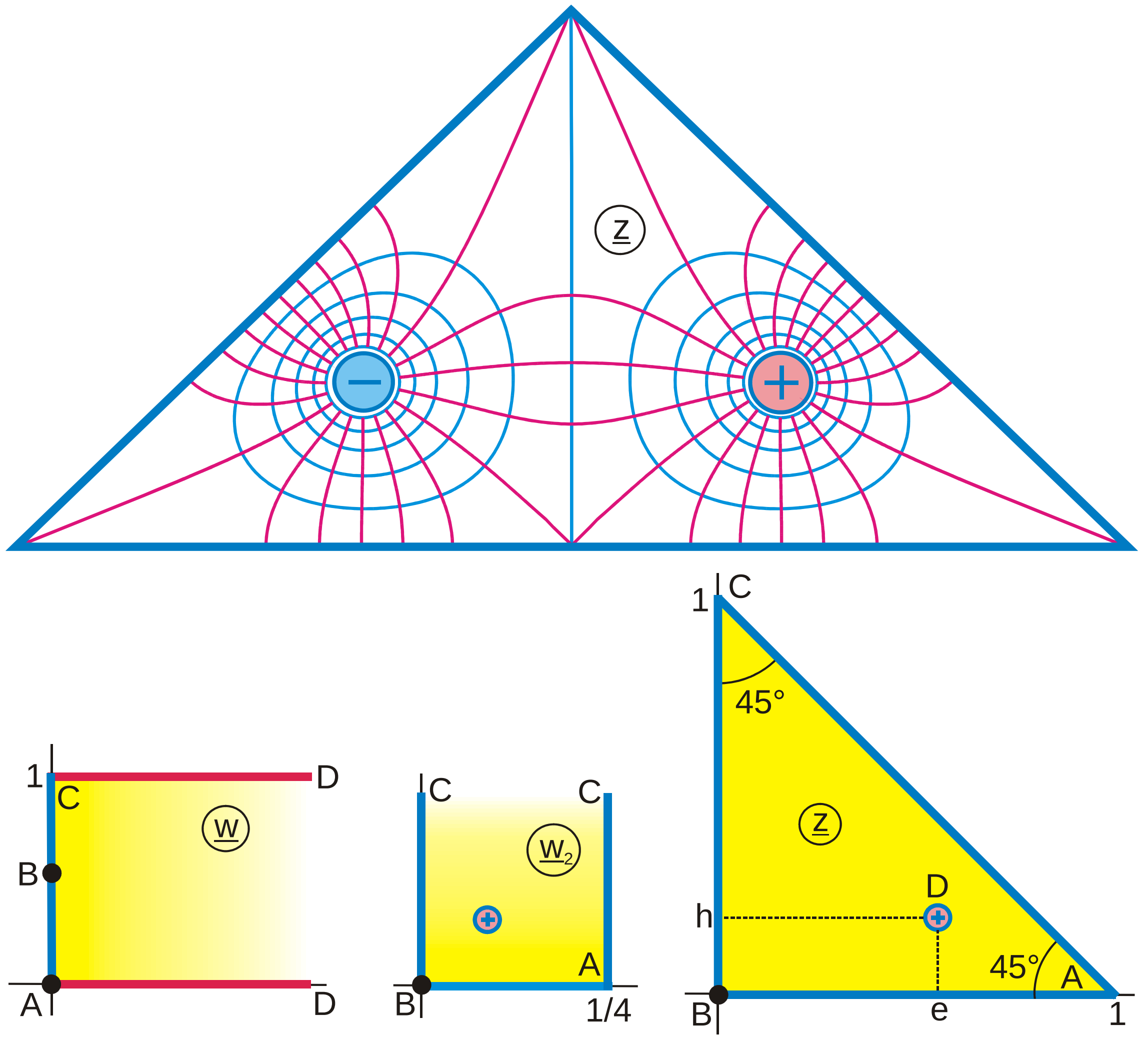


Abbildung F 8.4

$$z = \frac{1}{K(k)} F_a\left(\frac{\sin w_2}{k}, k\right) \qquad w_2 = \frac{1}{4}\left(\arcsin w_1 + \frac{\pi}{2}\right)$$

$$w_1 = a + jb \tanh(w\pi) \qquad v_C = 0{,}5$$

$$k = \frac{1}{\sqrt{2}}$$

gegeben: a, b

$$v_A = \frac{1}{\pi}\arctan\frac{a-1}{b} \qquad v_B = \frac{1}{\pi}\arctan\frac{a+1}{b}$$

$$0 \le u \le 0{,}25 \qquad 0 \le v \le 1$$

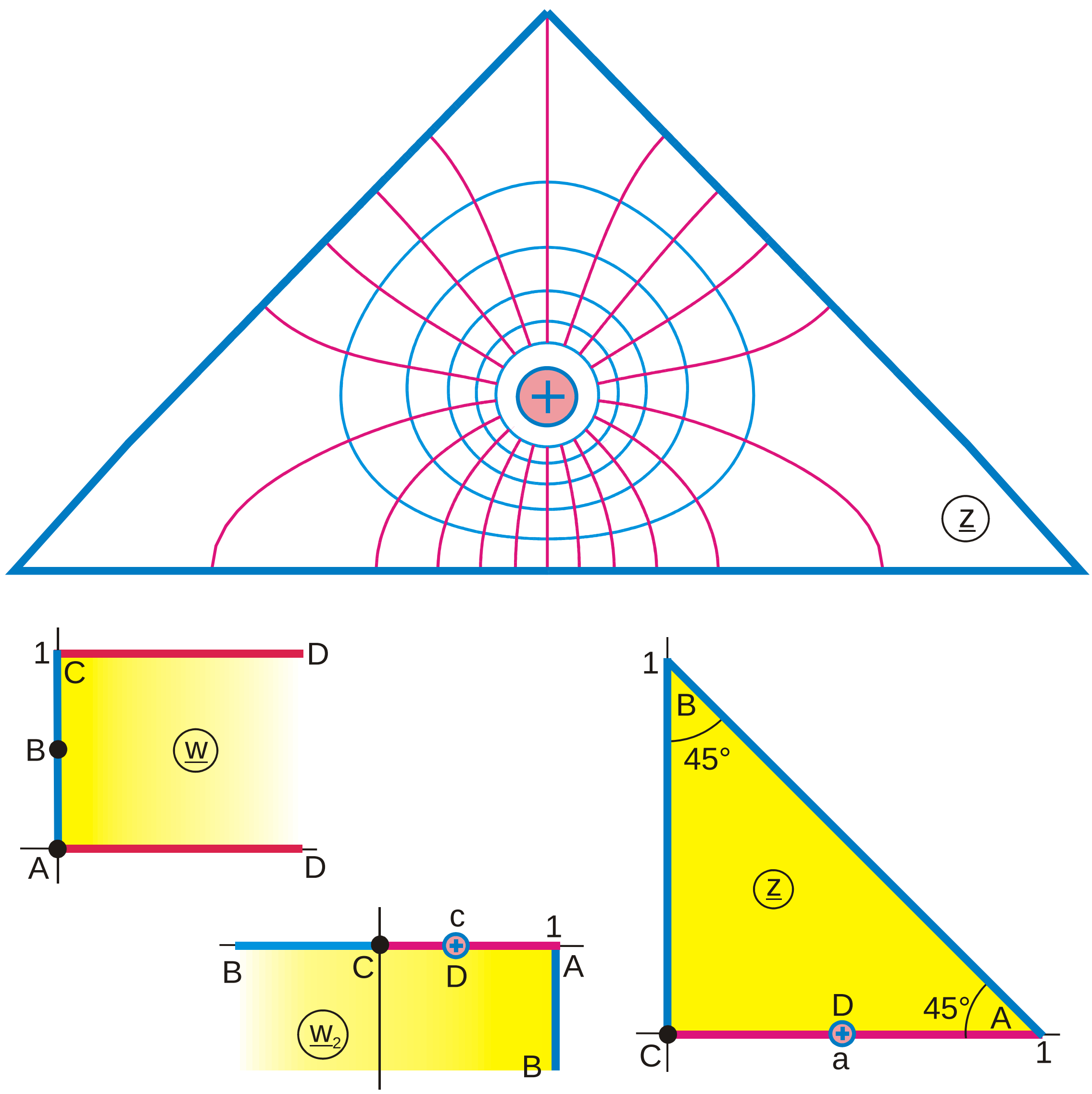


Abbildung F 8.5

$$z = \frac{1}{K(k)} F_a\left(\sqrt{w_2}, k\right)$$

$$w_2 = 1 - \sqrt{\frac{w_1}{b+1}}$$

$$w_1 = 1 + b + \frac{b+1+(b+1)\cosh(w\pi)}{b-1-(b+1)\cosh(w\pi)}$$

$$b = \frac{(1-c)^2}{1-(1-c)^2}$$

$$k = \frac{1}{\sqrt{2}}$$

gegeben: a

$$c = \mathrm{sn}^2\left[aK(k), k\right]$$

$$v_B = \frac{1}{\pi}\arccos\frac{b-1}{b+1}$$

$0 \le u \le 0{,}5$

$0 \le v \le 1$

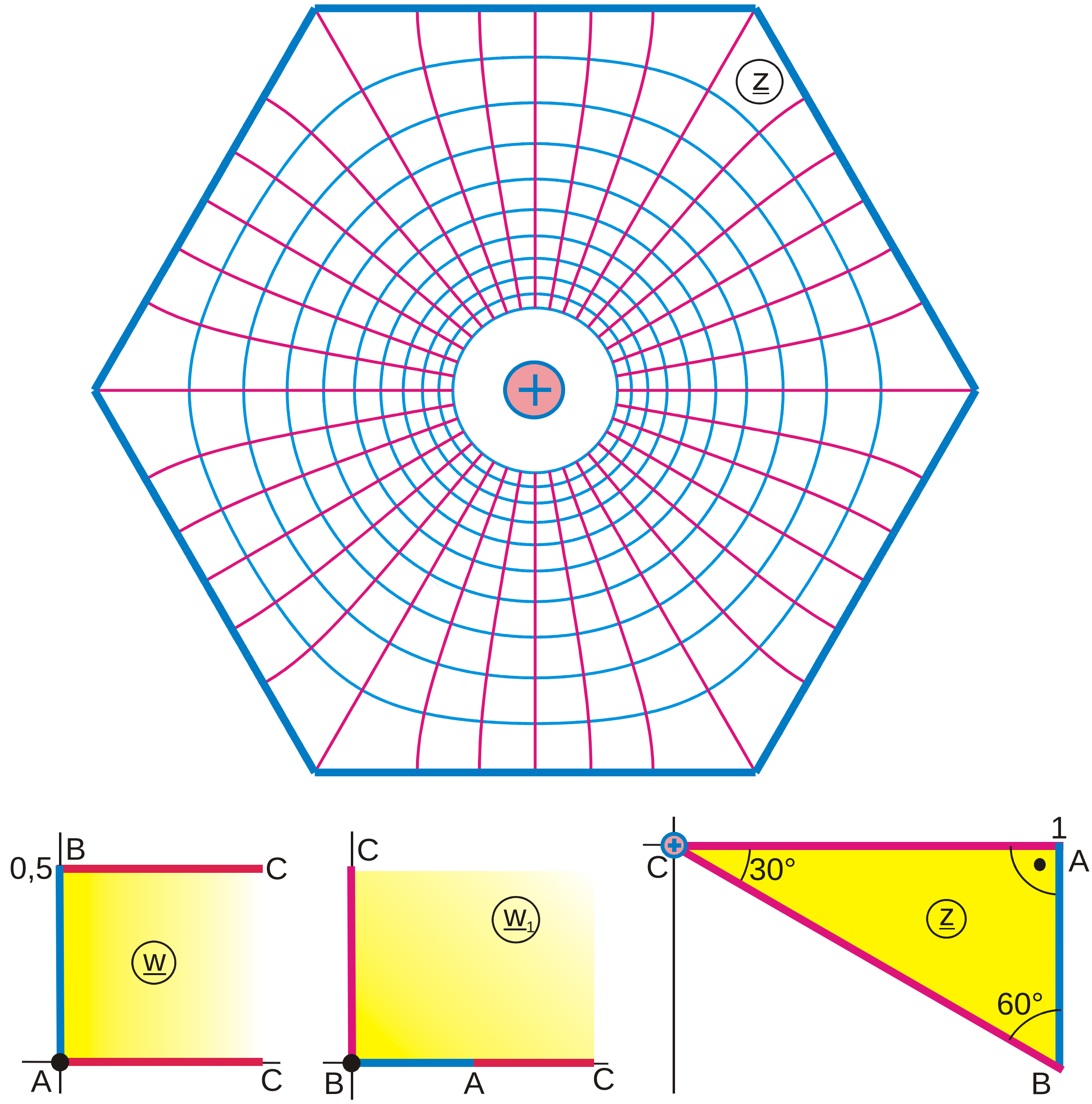


Abbildung F 8.6

$$z = 1 - \frac{1}{a} F_t(w_3, k) \qquad w_2 = \frac{\sqrt{3} - 1 - \sqrt[3]{w_1}}{\sqrt{3} - 1 + \sqrt[3]{w_1}}$$

$$w_3 = \arccos w_2 \qquad w_1 = \cosh(w\pi)$$

$$k = \frac{\sqrt{2 - \sqrt{3}}}{2} = 0,2588 \qquad a = K(k) + K'(k)/\sqrt{3}$$

$$0 \le u \le 1,5 \qquad 0 \le v \le 0,5$$

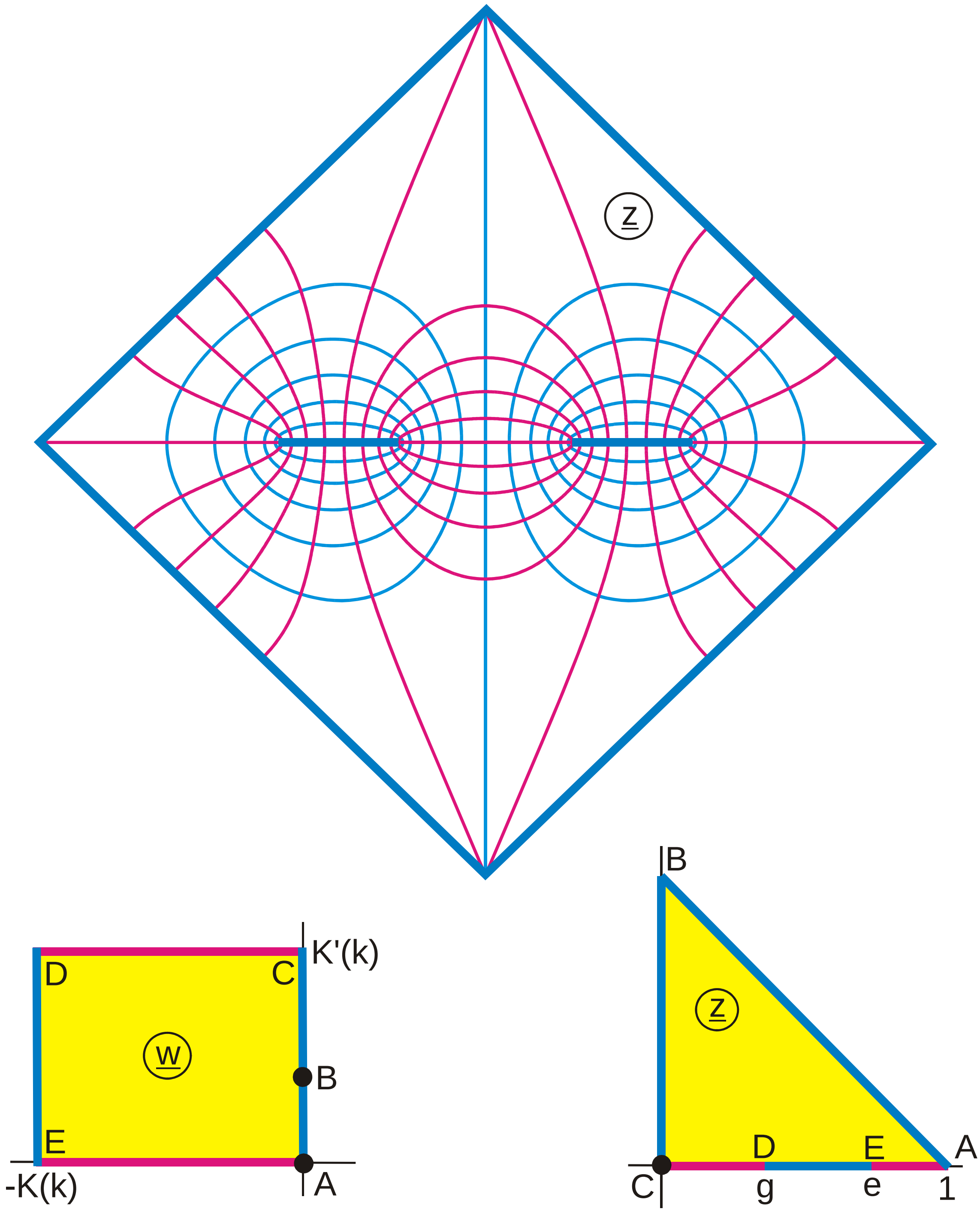


Abbildung F 8.7

$$z = \frac{1}{K(k_1)} F_a\left(\sqrt{\frac{2w_2^2}{1+w_2^2}}, k_1\right)$$

$$w_2 = w_1 + \sqrt{w_1^2 + 1}$$

$$w_1 = a\,\mathrm{sn}(w,k)$$

$$a = \frac{h - 1/h}{2}$$

$$k = \frac{2a}{b - 1/b}$$

$$v_B = \mathrm{Im}\,F_a(j/a, k)$$

$k_1 = 1/\sqrt{2}$ $\quad 0 \le v \le K'(k)$ $\quad -K(k) \le u \le 0$

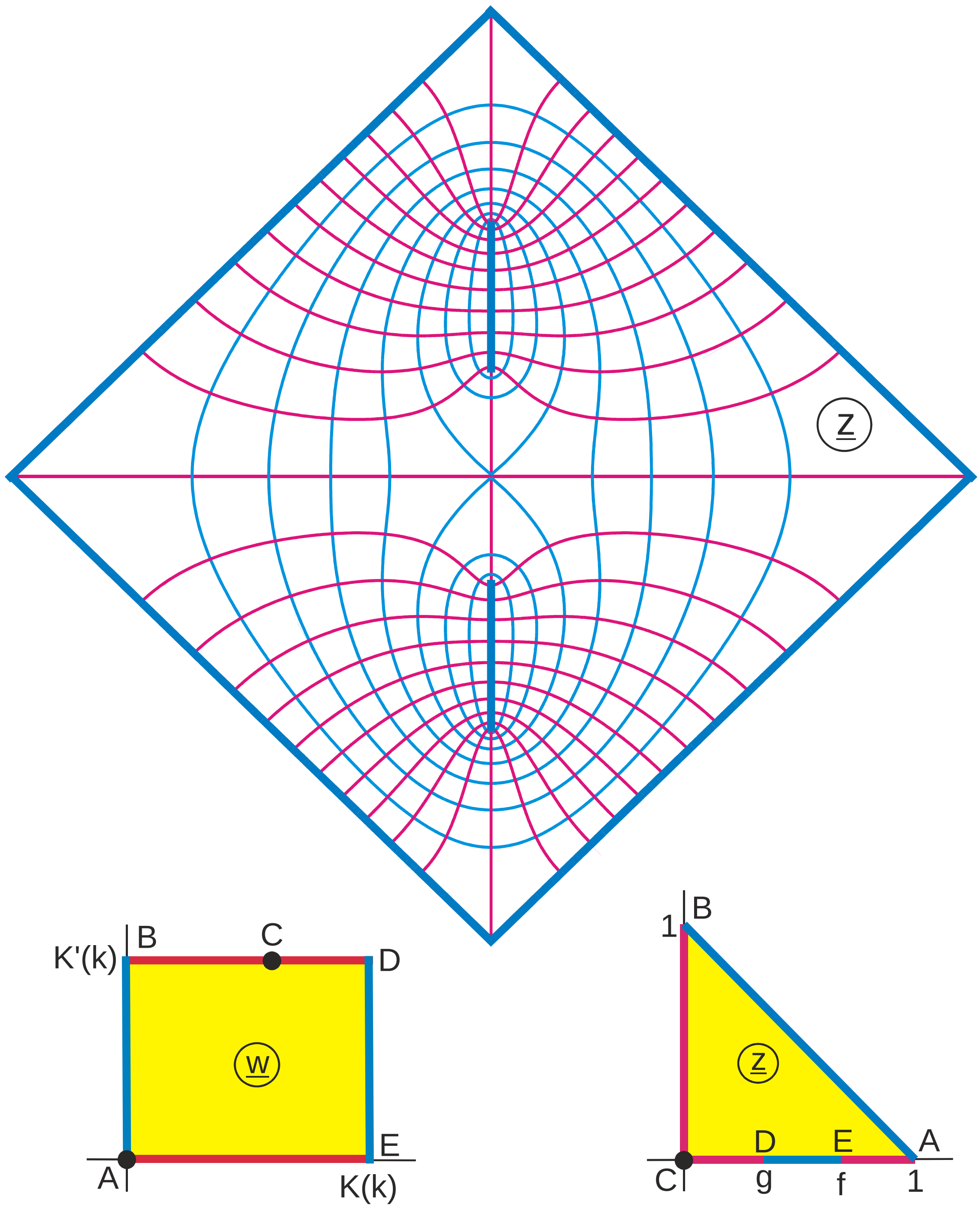


Abbildung F 8.8

$$z = \frac{1}{K(k_1)} F_a\left(\sqrt{\frac{2w_2^{\,2}}{1+w_2^{\,2}}}, k_1\right)$$

$$w_2 = \exp(-w_1 + j\pi/2)$$

$$w_1 = \operatorname{ar\,tanh}\{ak\,\mathrm{sn}(w,k)\}$$

$$k_1 = 1/\sqrt{2}$$

a = tanh (-ln c)

k = tanh (-ln e)/a

$$u_C = F_a(a,k)$$

gegeben: c, e (s. Abb. F 6.7)

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

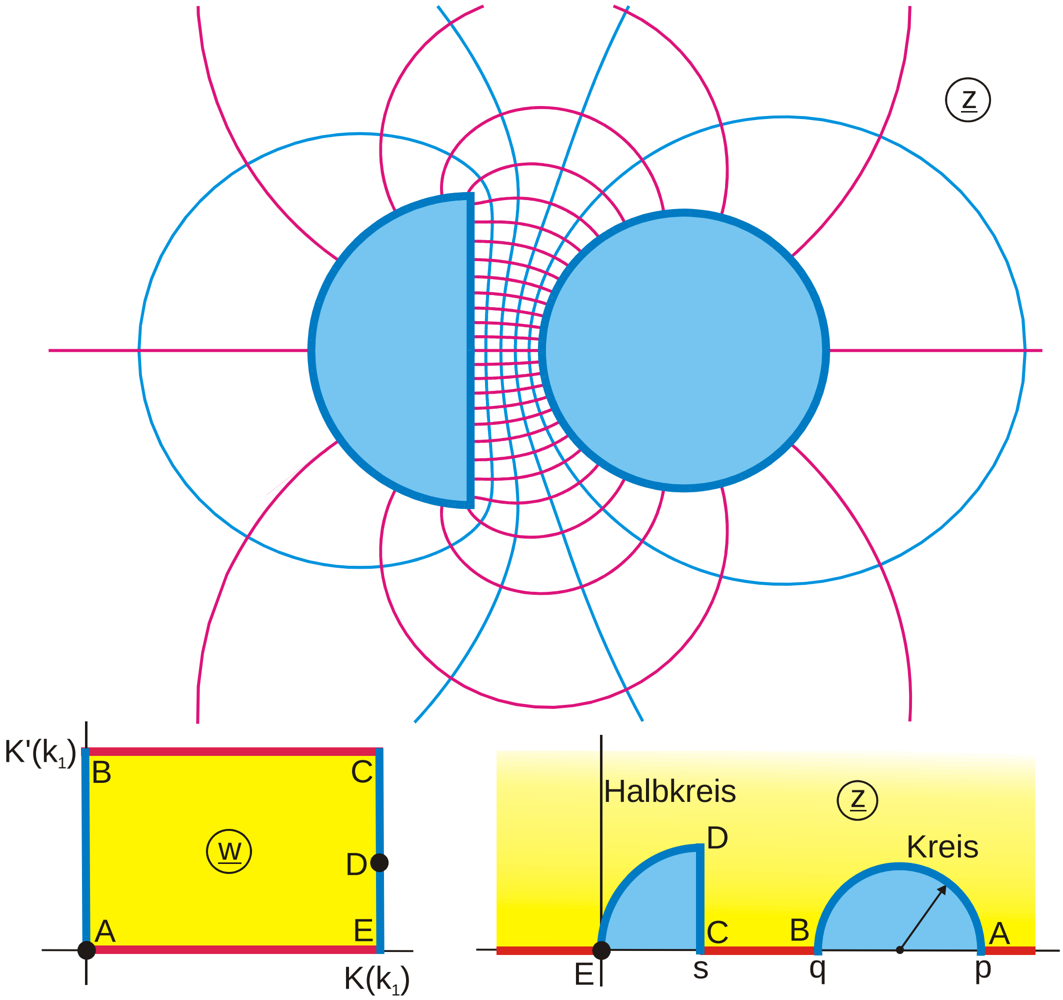


Abbildung F 9

$$z = \frac{1}{w_5 + \sigma r} \qquad w_5 = \exp(w_4) \ \text{(Abb. K4.1)}$$

$$w_4 = \frac{(h - w_3)\pi}{b_1} \qquad w_3 = \Pi_e\left(w_2, k, a\right)$$

$$w_2 = K(k) + jK'(k) - F_a\left(w_1, k\right) \qquad w_1 = \frac{k_1}{k}\operatorname{sn}(w, k_1)$$

$$\text{gegeben}: \tau = K'(k)/K(k)\,,\ d, \sigma = 1 \qquad h = K(k)\{1 + b\, Z_e(a,k)\}$$

$$b_1 = b\left\{K'(k)\, Z_e(a,k) + \frac{\pi a}{2K(k)}\right\} + K'(k) \qquad v_D = \operatorname{Im} F_a\left(\frac{k}{k_1}, k_1\right)$$

$$b_2 = b\left\{K'(k)\, Z_e(a,k) + \frac{\pi a}{2K(k)} - \frac{\pi}{2}\right\} + K'(k) \qquad \varphi = \frac{\pi b_2}{b_1} \qquad r = \exp\left(\frac{h\pi}{b_1}\right)$$

$$a = (1 - d)\, K(k) \qquad p = 1/(r - 1) \qquad k = \{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\}^2$$

$$k_1 = k \operatorname{sn}\{d\ K(k), k\} \qquad s = \frac{1}{2r} \qquad b = \frac{\operatorname{sn}(a,k)}{\operatorname{cn}(a,k)\operatorname{dn}(a,k)}$$

$$0 \le u \le K(k_1) \qquad 0 \le v \le K'(k_1) \qquad q = \frac{1}{r + 1}$$

$$d = 0{,}3505 \qquad \sigma = 1 \qquad \tau = 2{,}2$$

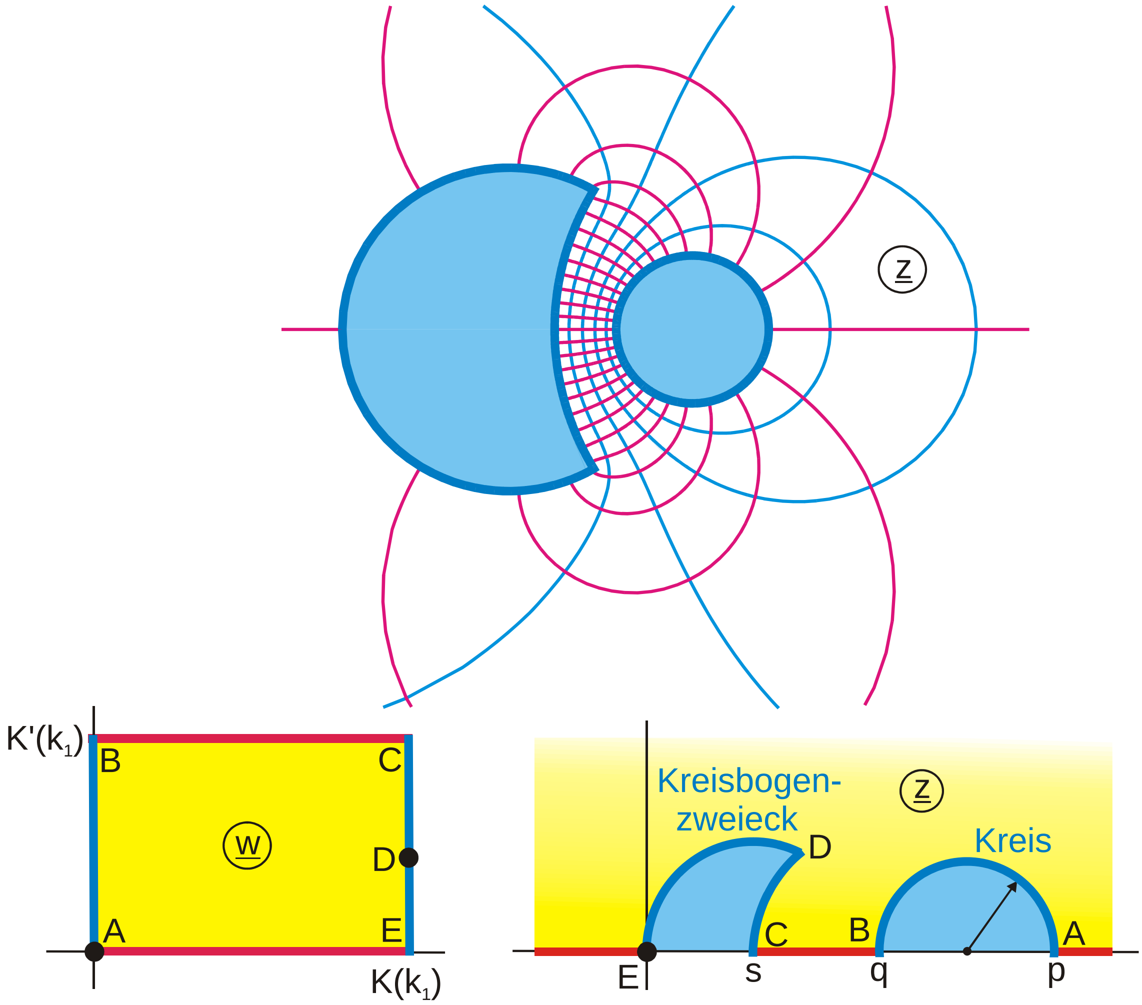


Abbildung F 9.1

$$z = \frac{1}{w_5 + \sigma r} \qquad w_5 = \exp(w_4) \text{ (Abb. K4.1)}$$

$$w_4 = \frac{(h - w_3)\pi}{b_1} \qquad w_3 = \Pi_e(w_2, k, a)$$

$$w_2 = K(k) + jK'(k) - F_a(w_1, k) \qquad w_1 = \frac{k_1}{k}\operatorname{sn}(w, k_1)$$

gegeben: $\tau = K'(k)/K(k)$, d, σ $\qquad h = K(k)\{1 + b\,Z_e(a,k)\}$

$$b_1 = b\left\{K'(k)\,Z_e(a,k) + \frac{\pi a}{2K(k)}\right\} + K'(k) \qquad v_D = \operatorname{Im} F_a\left(\frac{k}{k_1}, k_1\right)$$

$$b_2 = b\left\{K'(k)\,Z_e(a,k) + \frac{\pi a}{2K(k)} - \frac{\pi}{2}\right\} + K'(k) \qquad \varphi = \frac{\pi b_2}{b_1} \qquad r = \exp\left(\frac{h\pi}{b_1}\right)$$

$$a = (1-d)\,K(k) \qquad p = 1/(r-1) \qquad k = \{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\}^2$$

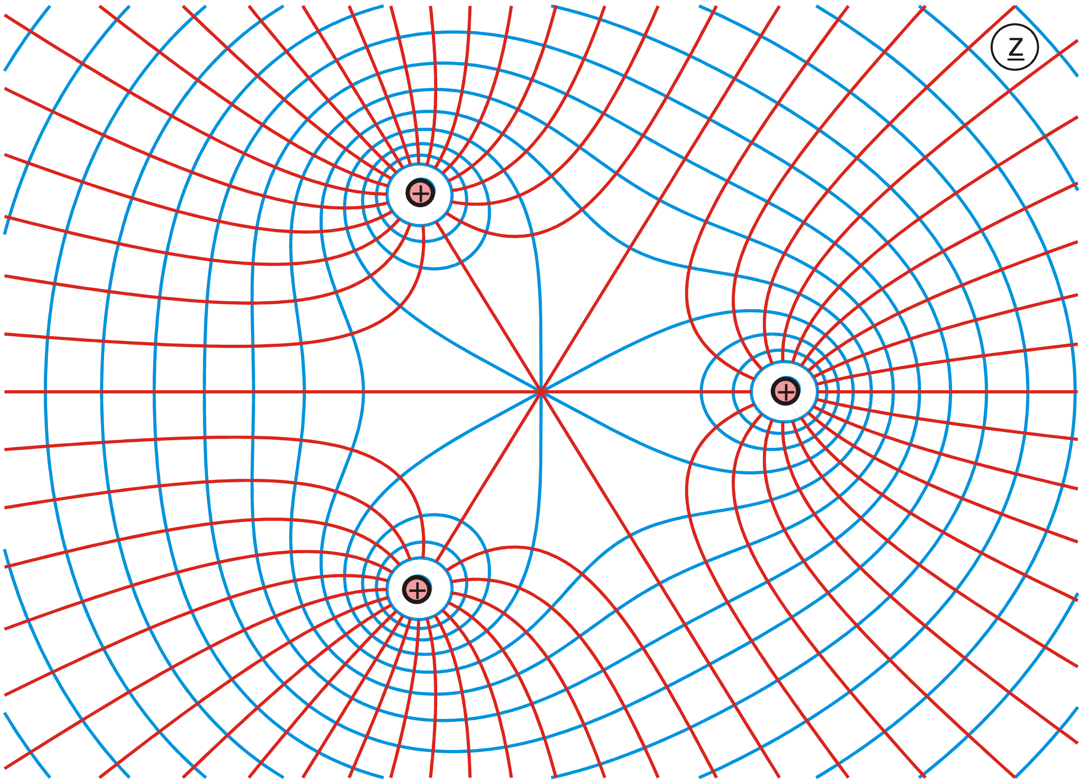
$$k_1 = k\operatorname{sn}\{d\,K(k), k\} \qquad s = \frac{1}{2r} \qquad b = \frac{\operatorname{sn}(a,k)}{\operatorname{cn}(a,k)\operatorname{dn}(a,k)}$$

$$0 \le u \le K(k_1) \qquad 0 \le v \le K'(k_1) \qquad q = \frac{1}{r+1}$$

$$d = 0{,}3505 \qquad \sigma = 1{,}75 \qquad \tau = 2{,}2$$

Abbildungen Gruppe G

Radialsymmetrische Feldbilder



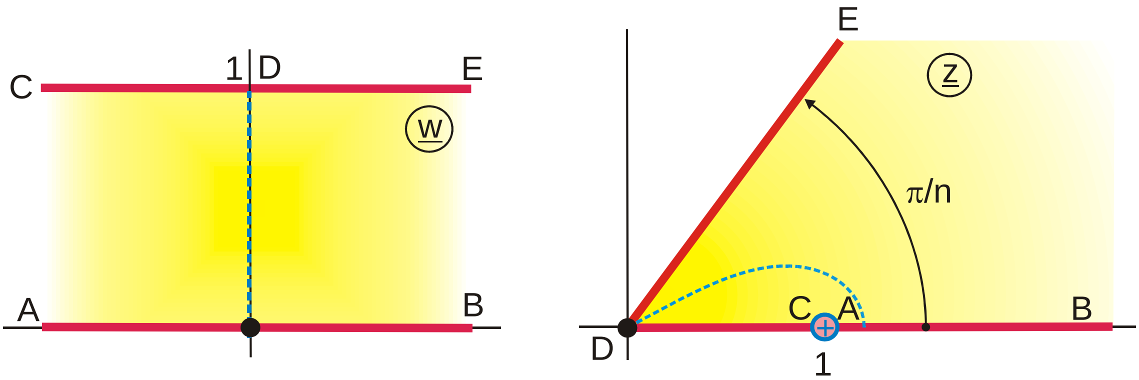
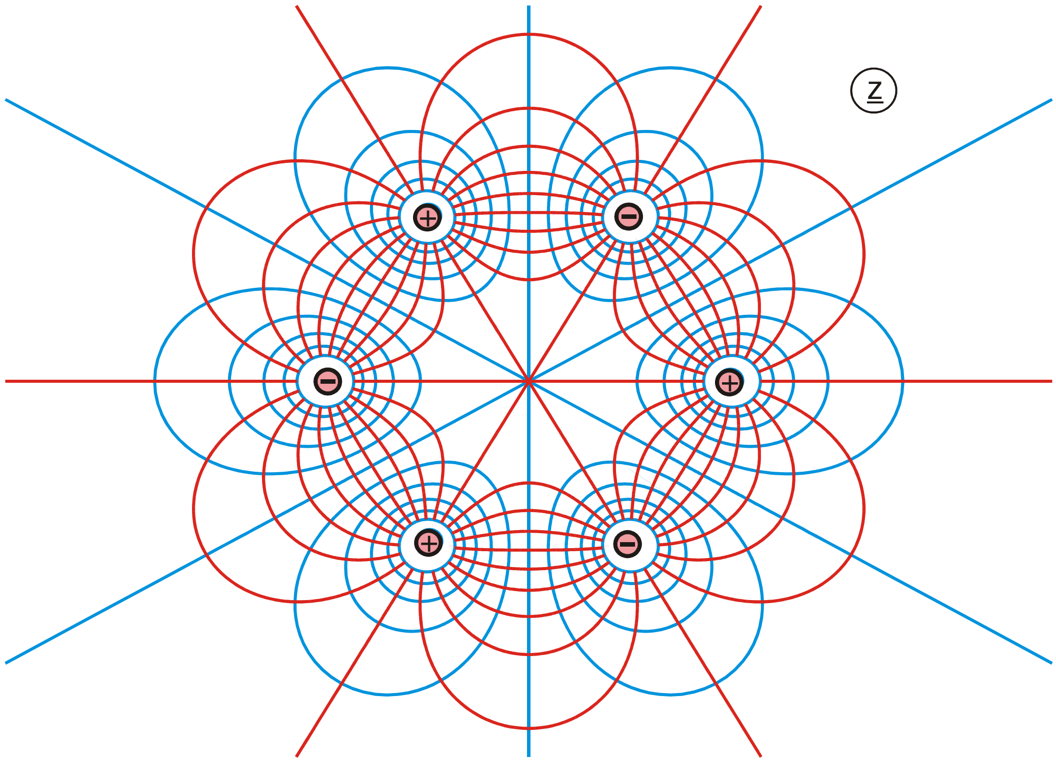


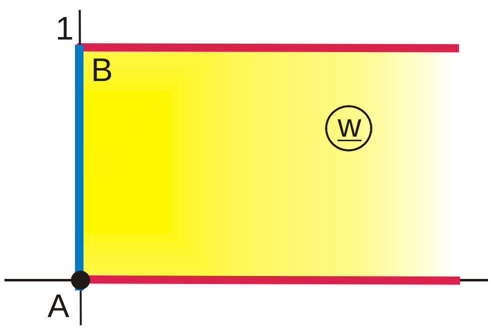
Abbildung G 1

$z = [1 + \exp(w\pi)]^{1/n}$

$n = 3$

$-0,3 \leq u \leq 1,2$ $0 \leq v \leq 1$





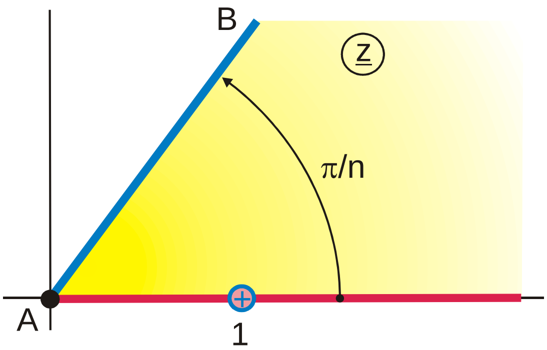


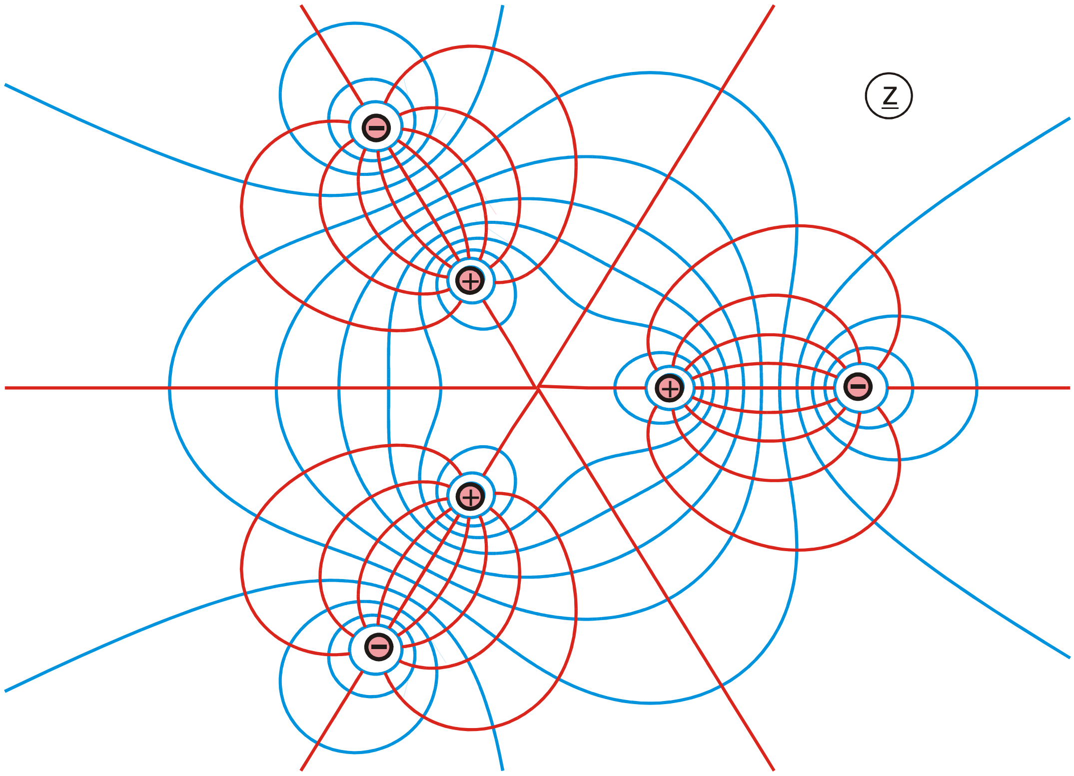
Abbildung G 1.1

$$z = \left(\frac{w_1 - 1}{w_1 + 1} \right)^{2/n}$$

$w_1 = \exp(\pi w)$

$0 \le u \le 0,5$ $0 \le v \le 1$

$n = 6$



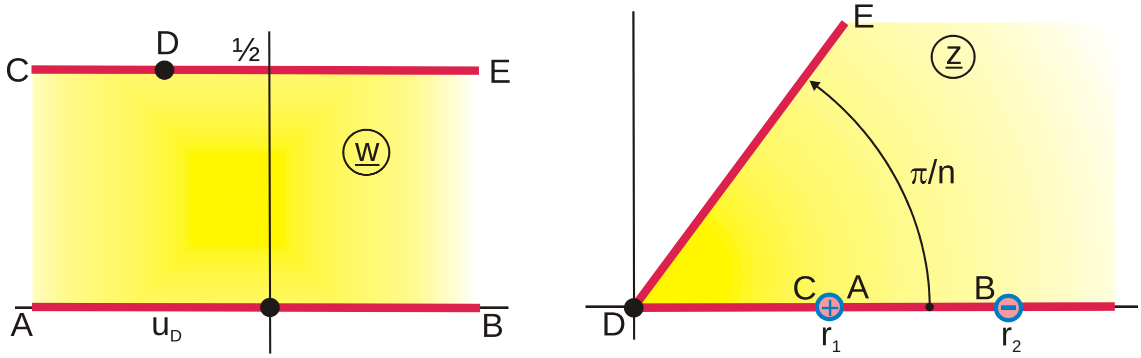


Abbildung G 1.2

$z = [1 + \sigma + \tanh(w\pi)]^{1/n}$

$r_2 = (2 + \sigma)^{1/n}$

$r_1 = \sigma^{1/n}$

$-0{,}6 \leq u \leq 0{,}4$

$0 \leq v \leq 0{,}5$

$u_D = \frac{1}{\pi} \operatorname{ar\,tanh}\left(\frac{-1}{1+\sigma}\right)$

$\sigma \geq 0$

$r_1 = 0 \quad \text{für} \quad \sigma = 0$

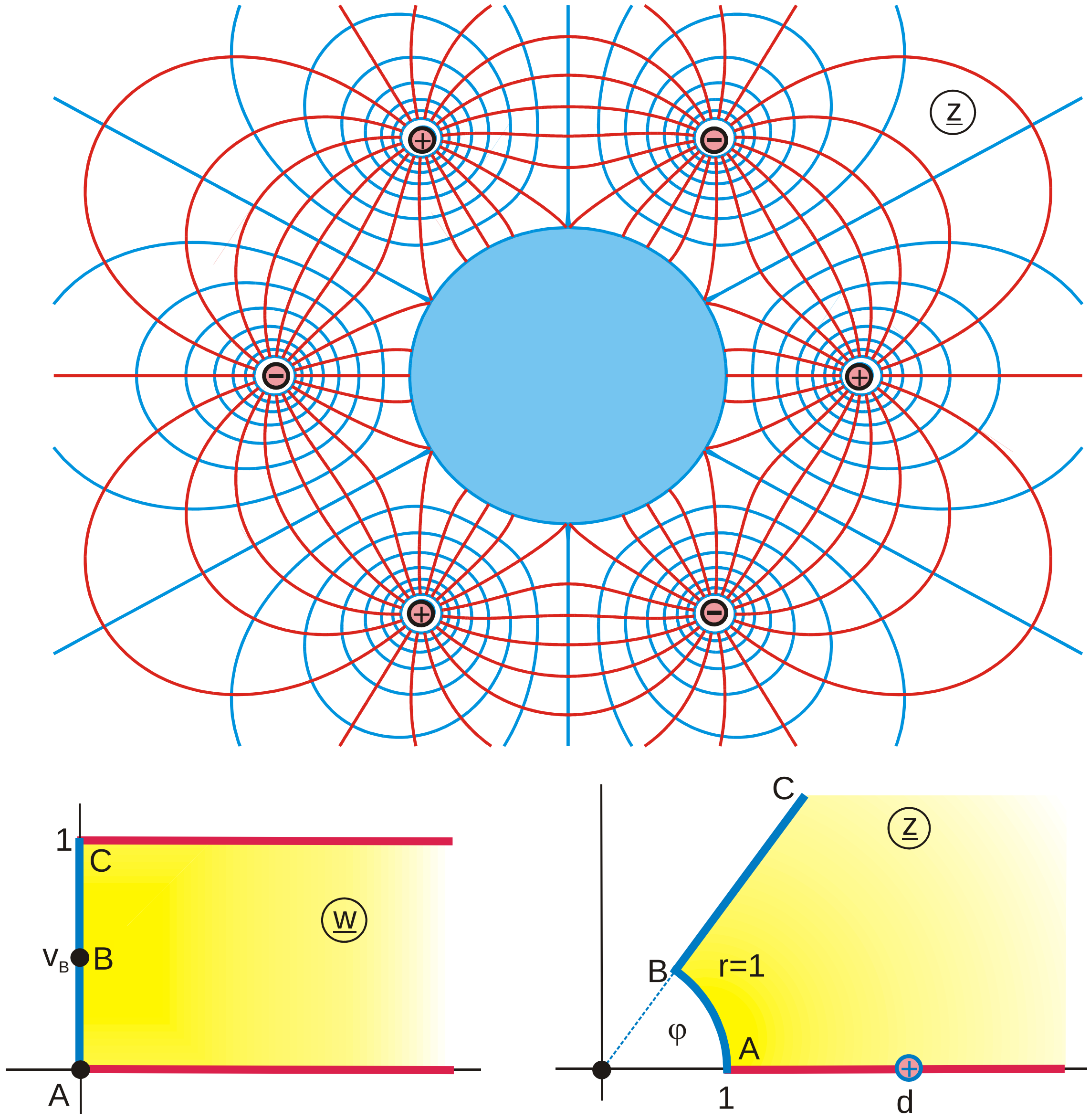


Abbildung G 1.3

$$z = \left(j w_2 + \sqrt{1 - {w_2}^2} \right)^b \qquad w_2 = ja\frac{1 - w_1}{1 + w_1}$$

$w_1 = \exp(\pi w)$

$b = 2/n \qquad \varphi = b\pi$

$$a = \sinh\left(\frac{\ln d}{b}\right) \qquad v_B = \frac{2}{\pi}\arctan\frac{1}{a}$$

$0 \le u \le 0{,}7 \qquad 0 \le v \le 1$

gegeben: d, n

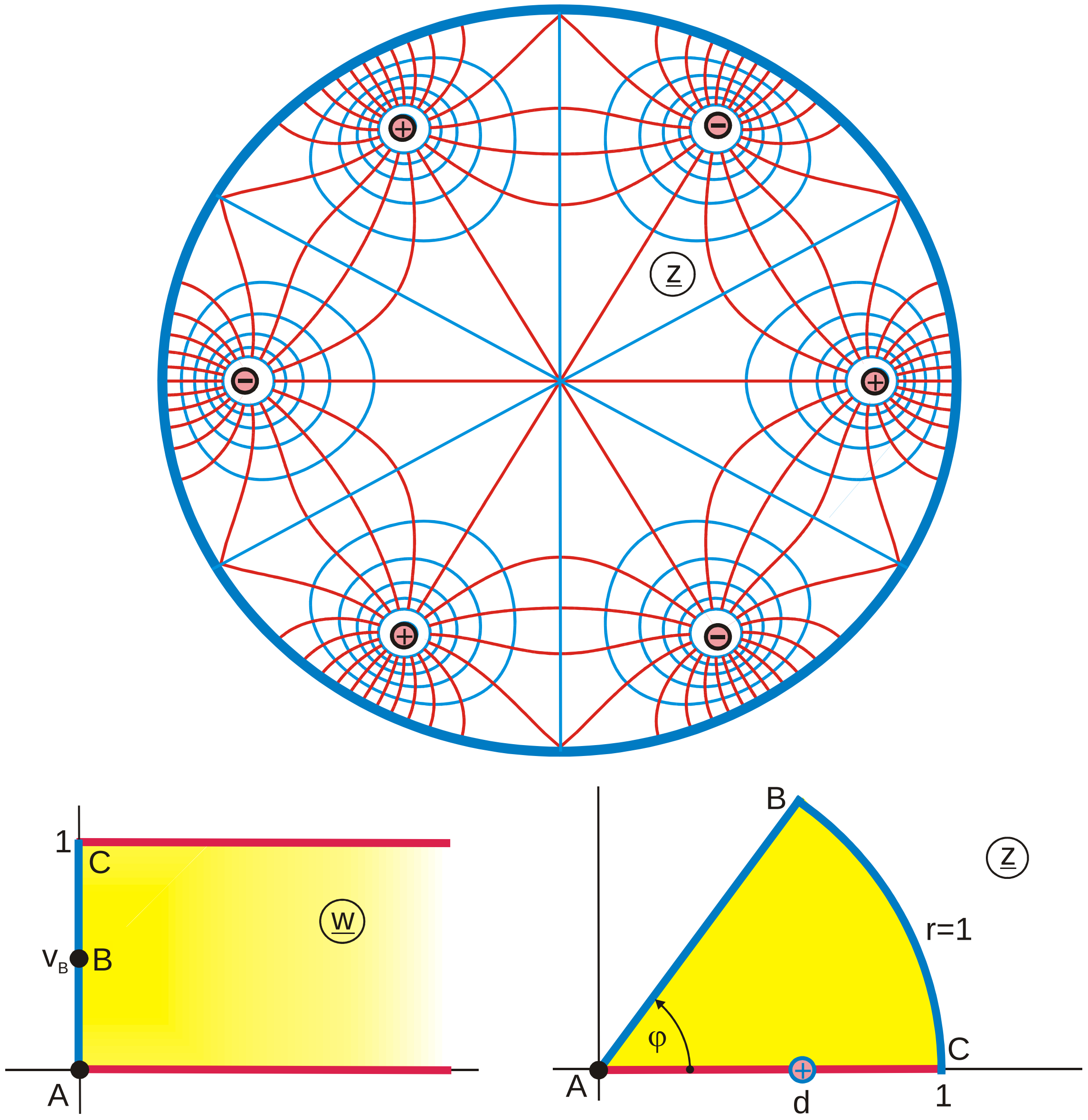


Abbildung G 1.4

$$z = \left(jw_2 + \sqrt{1 - w_2^{\,2}} \right)^{-b}$$

$$w_2 = ja \frac{1 + w_1}{1 - w_1}$$

$$w_1 = \exp(\pi w)$$

$$d = \left(a + \sqrt{1 + a^2} \right)^{-b}$$

$$b = 2/n$$

$$\varphi = b\pi/2$$

$$a = -\sinh\left(\frac{\ln d}{b} \right)$$

$$v_B = \frac{2}{\pi} \arctan a$$

$$0 \le u \le 0{,}5$$

$$0 \le v \le 1$$

gegeben: d, n

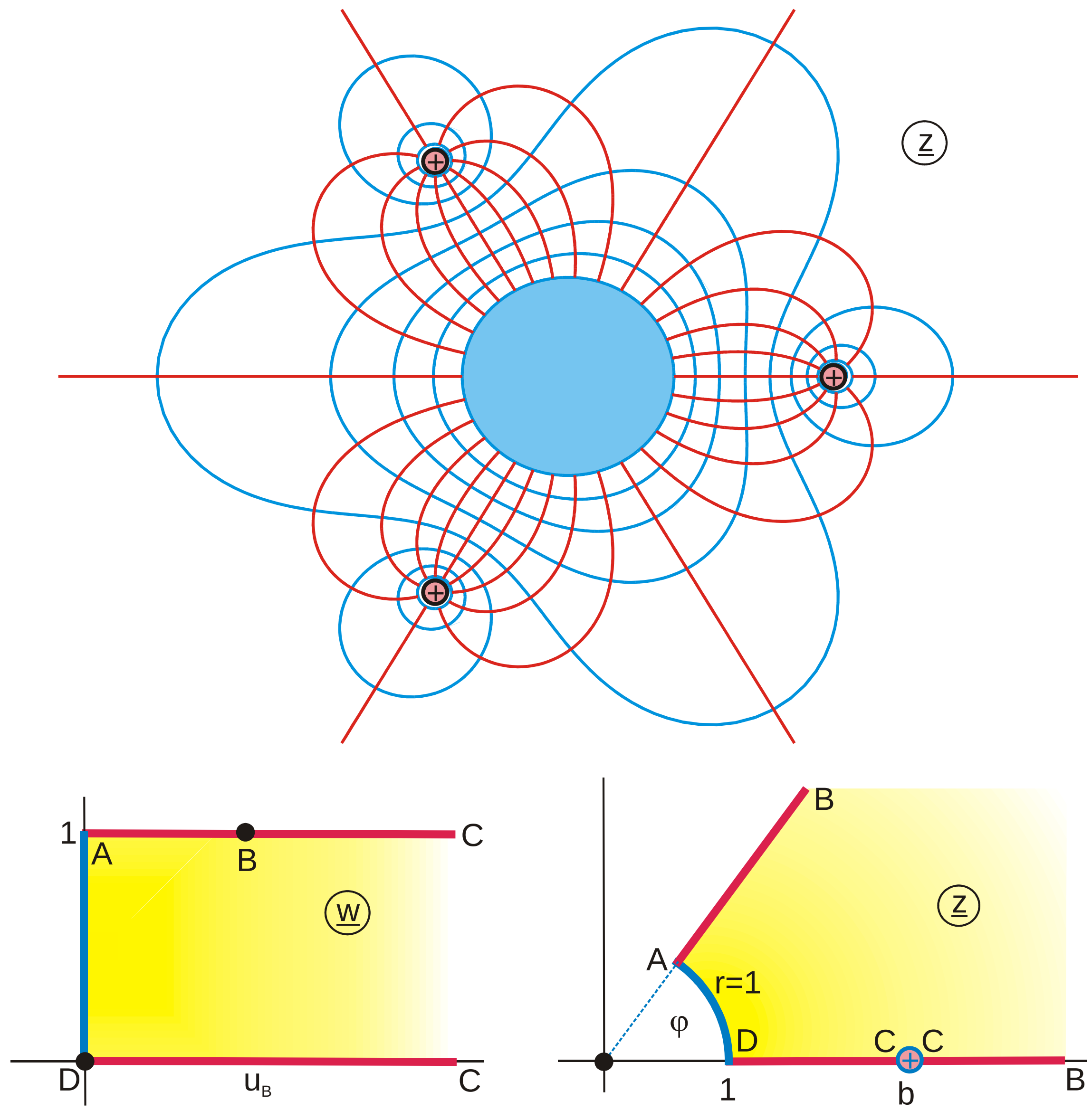


Abbildung G 1.5

$z = w_2^{1/n}$

$w_2 = \dfrac{1 + a w_1}{a + w_1}$

$w_1 = \exp(\pi w)$

$a = b^n$

$\varphi = \pi / n$

$a = -\sinh\left(\dfrac{\ln d}{b}\right)$

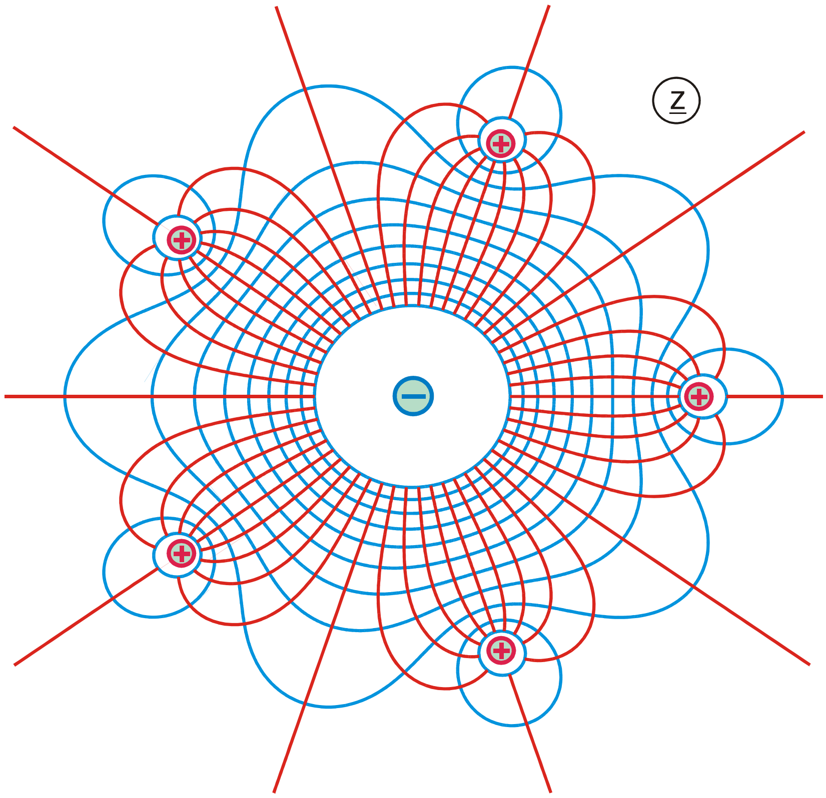
$u_B = \dfrac{\ln a}{\pi}$

$0 \le u \le 1{,}4$

$0 \le v \le 1$

gegeben: b, n

$b < 1$ zulässig



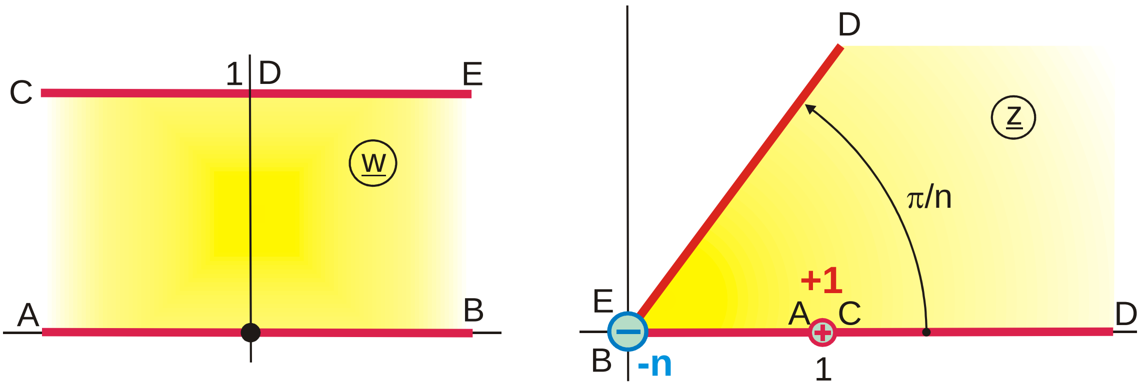


Abbildung G 1.6

$$z = \frac{1}{[1 + \exp(w\pi)]^{1/n}}$$

n = 5

-0,3 ≤ u ≤ 1,7 0 ≤ v ≤ 1

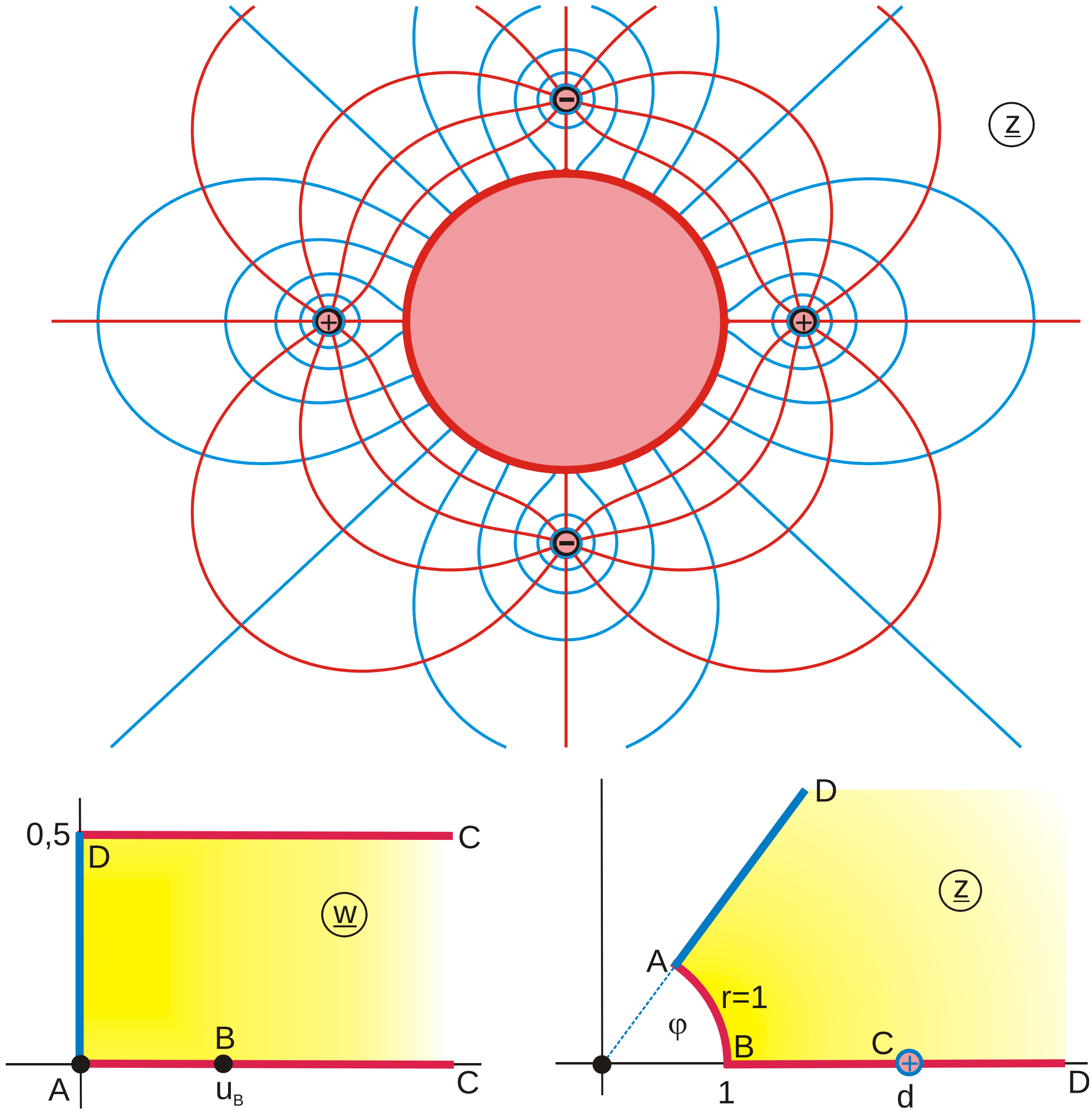


Abbildung G 2

$z = w_4^{\,2/n}$

$w_4 = \exp(w_3/2)$

$w_3 = j\left(\pi/2 - \arcsin w_2\right)$

$w_2 = (1+a)w_1 - 1$

$w_1 = \tanh^2(\pi w)$

$b = d^{n/2}$

$\varphi = \pi/n$

$a = \cosh\left(2\ln b\right)$

$u_B = \frac{1}{\pi}\arctan\sqrt{\frac{2}{1+a}}$

$0 \le u \le 0{,}5$

$0 \le v \le 0{,}5$

gegeben: d, n

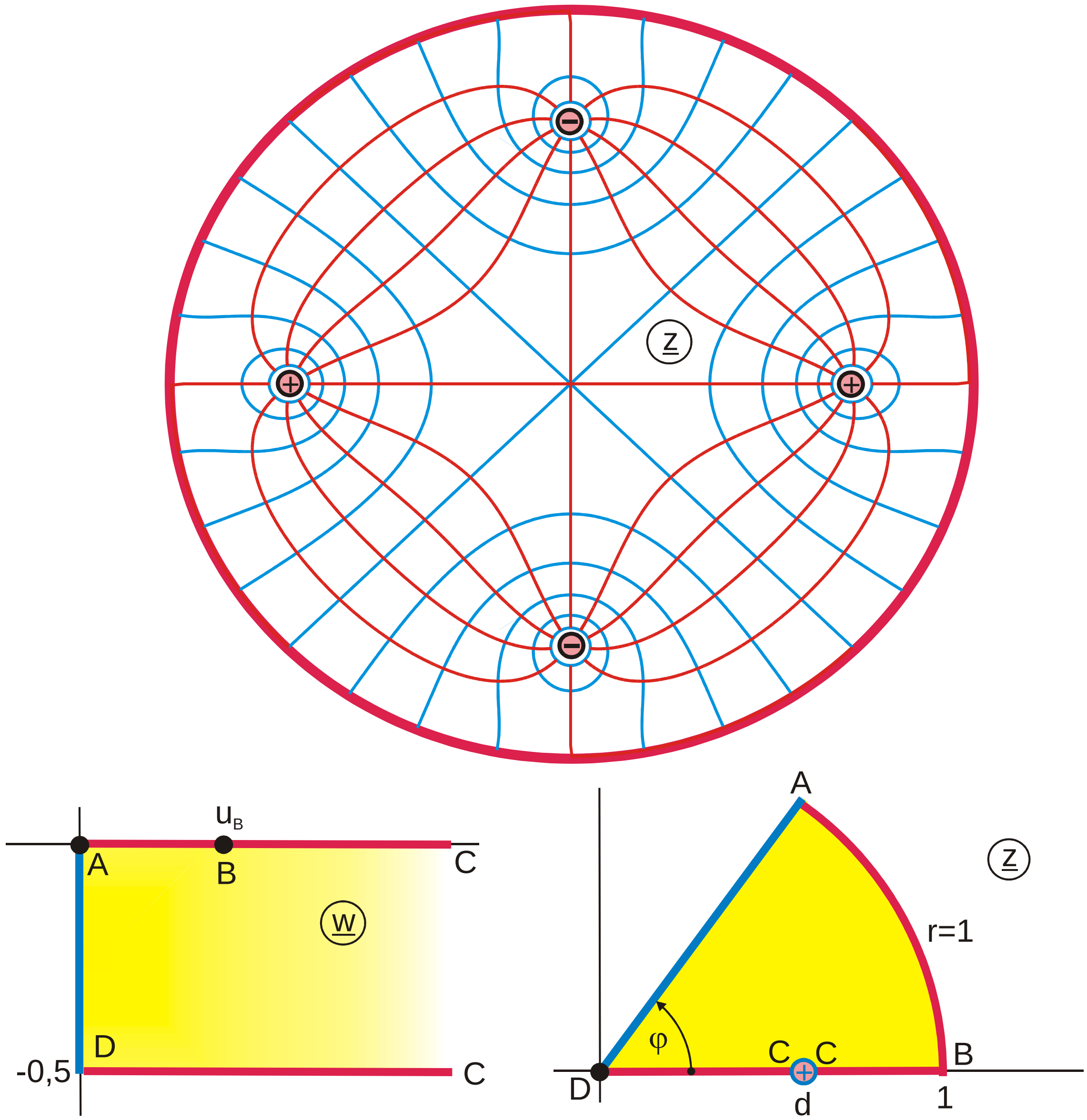


Abbildung G 2.1

$z = w_4^{\,2/n}$

$w_4 = \exp(w_3/2)$

$w_3 = j\left(\pi/2 - \arcsin w_2\right)$

$w_2 = (1+a)w_1 - 1$

$w_1 = \tanh^2(\pi w)$

$b = d^{n/2}$

$\varphi = \pi/n$

$a = \cosh\left(2\ln b\right)$

$u_B = \frac{1}{\pi}\,\mathrm{ar\,tanh}\sqrt{\frac{2}{1+a}}$

$0 \le u \le 0{,}5$

$-0{,}5 \le v \le 0$

gegeben: d, n

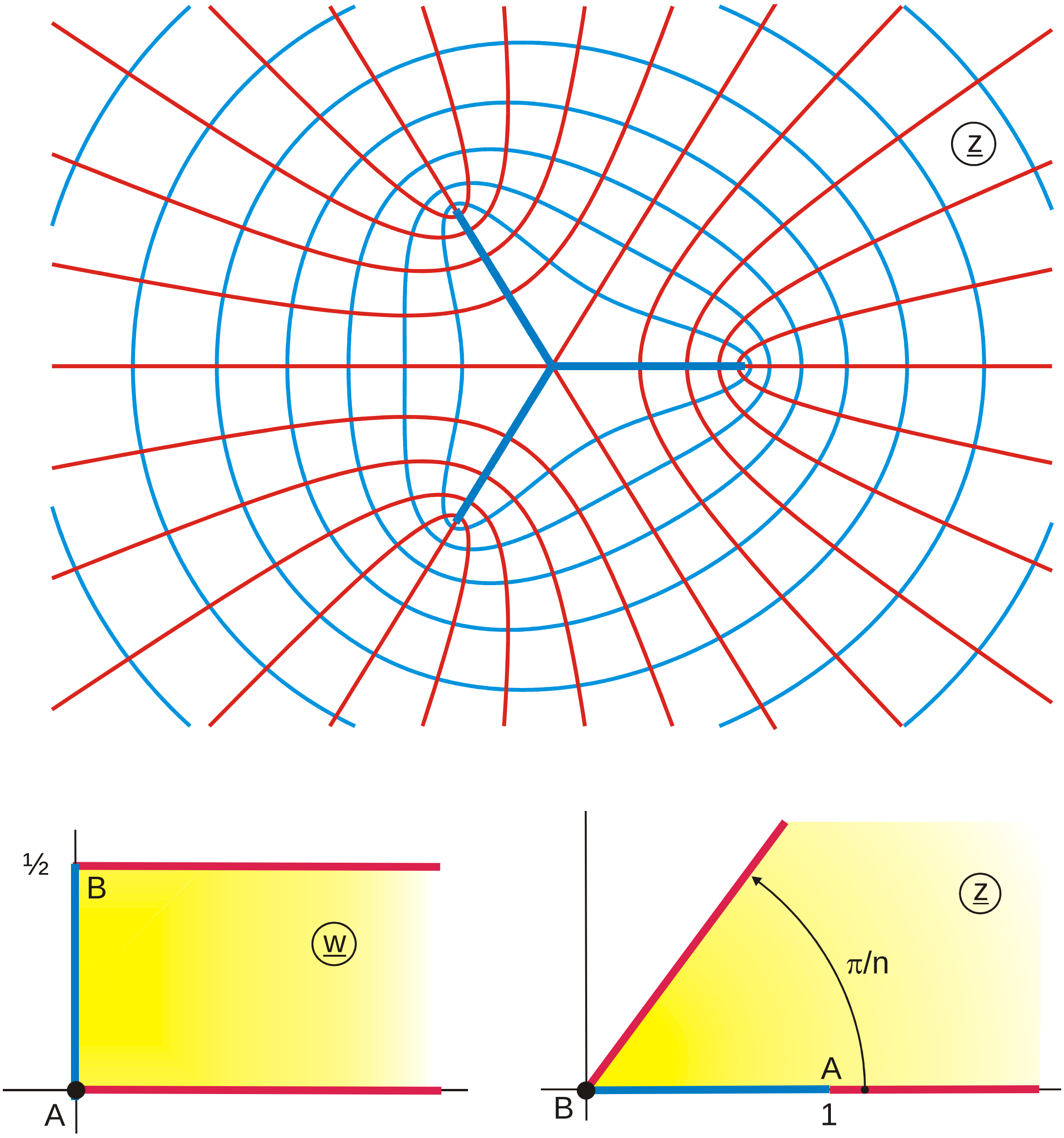


Abbildung G 3

$z = [\cosh(w\pi)]^{2/n}$

$0 \leq u \leq 2$ $0 \leq v \leq 0{,}5$

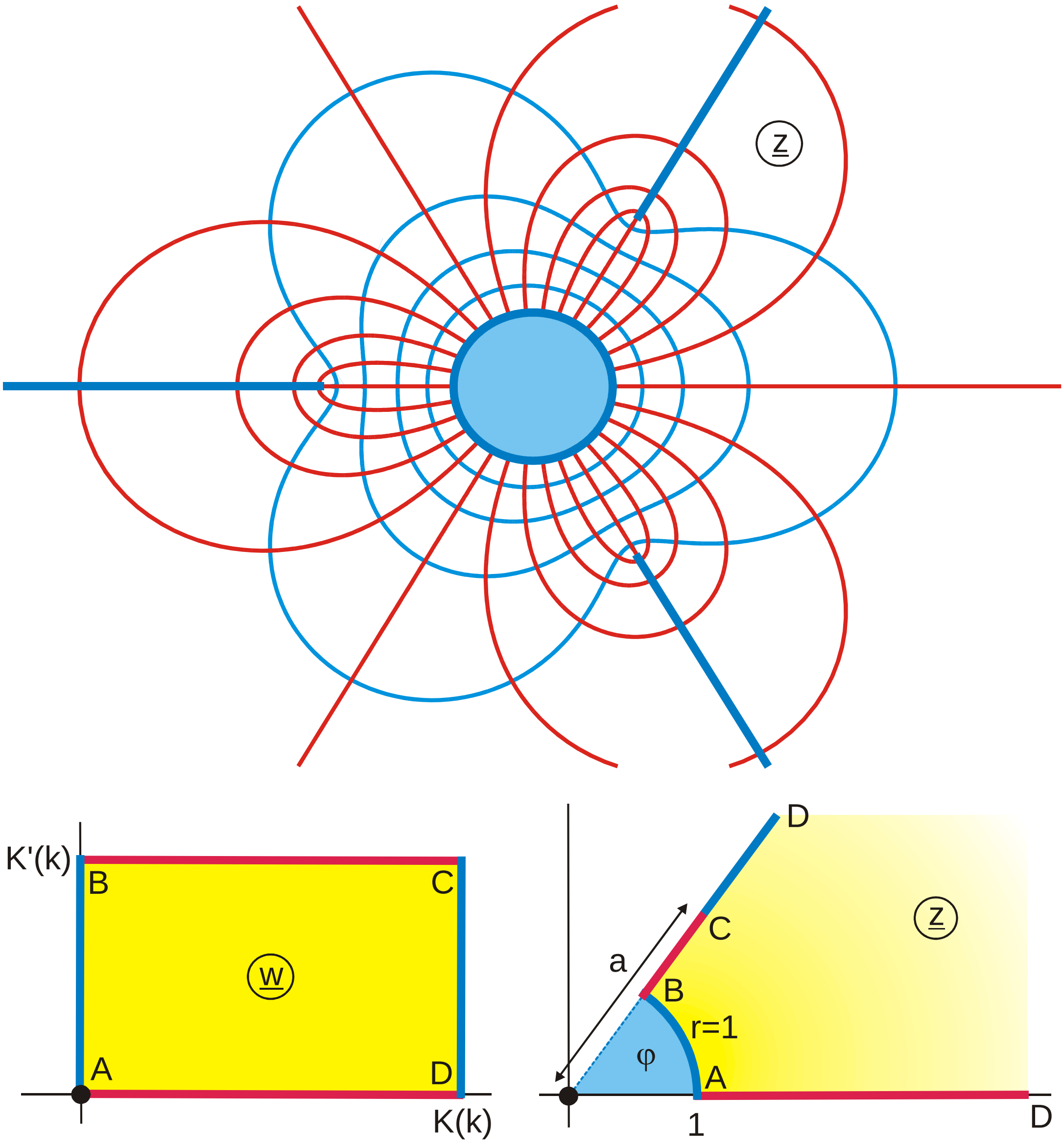


Abbildung G 3.1

$$z = \left[\frac{1 + sn(w,k)}{1 - sn(w,k)} \right]^{1/n}$$

$s = a^n$ $\qquad$ $k = \frac{s}{s+2}$

$\varphi = \pi/n$

gegeben: n, a

$0 \leq u \leq K(k)$ $\qquad$ $0 \leq v \leq K'(k)$

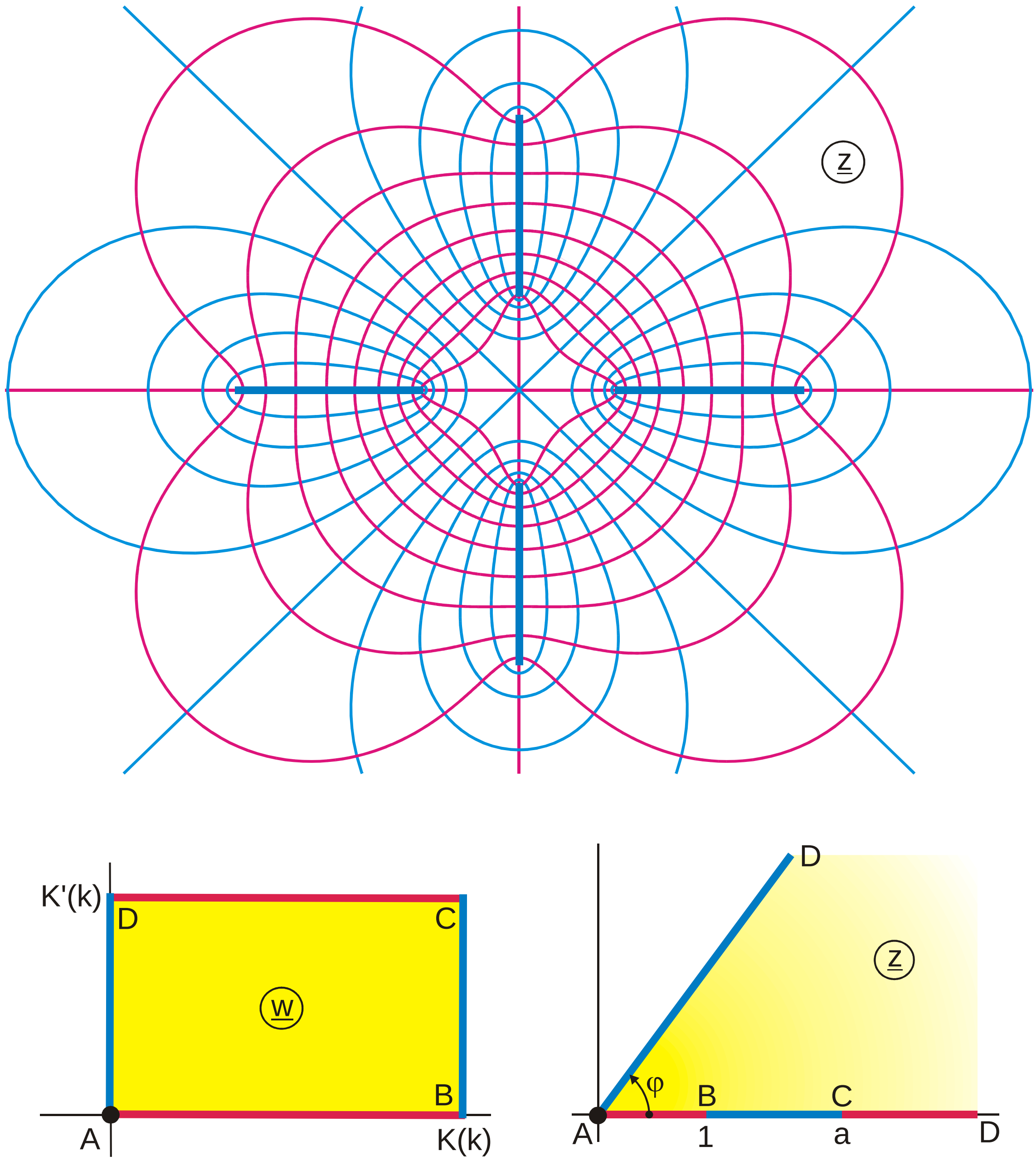


Abbildung G 3.2

$z = [\mathrm{sn}(w,k)]^{2/n}$

$k = 1/a^{n/2}$ $\varphi = \pi/n$

gegeben: n, a

$0 \le u \le K(k)$ $0 \le v \le K'(k)$

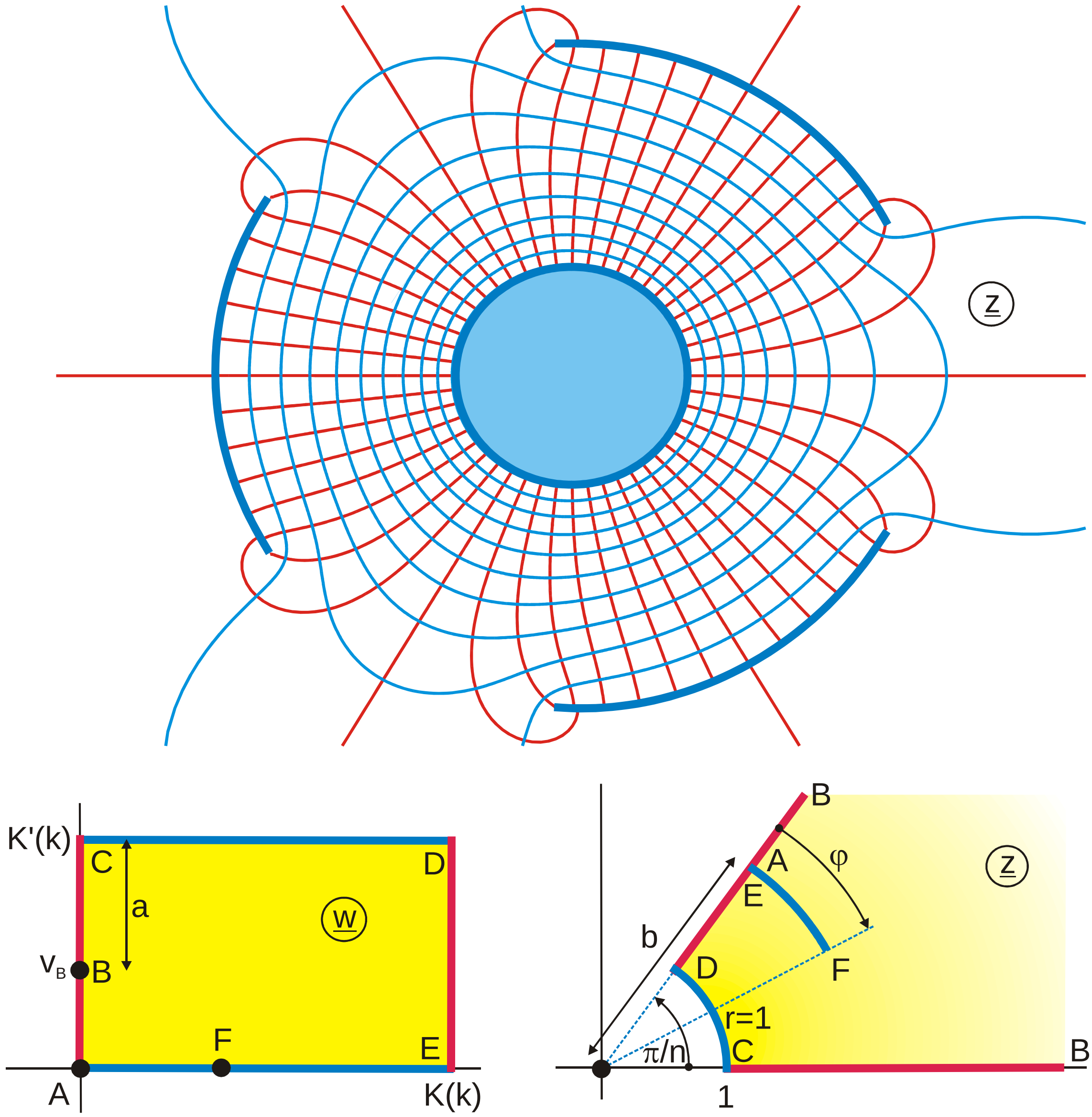


Abbildung G 4

$$z = w_1^{1/n}$$

gegeben: b, k, n

$$w_1 = -r \frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w - ja), k\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w + ja), k\right]}$$

$$r = b^n$$

$$a = \frac{K(k)}{\pi} \ln r$$

$$0 < a < K'(k)$$

$$\sigma = \frac{Z_e(ja, k)}{k^2 \, sn(ja)\left[cn(ja)\, dn(ja) + sn(ja)\, Z_e(ja)\right]}$$

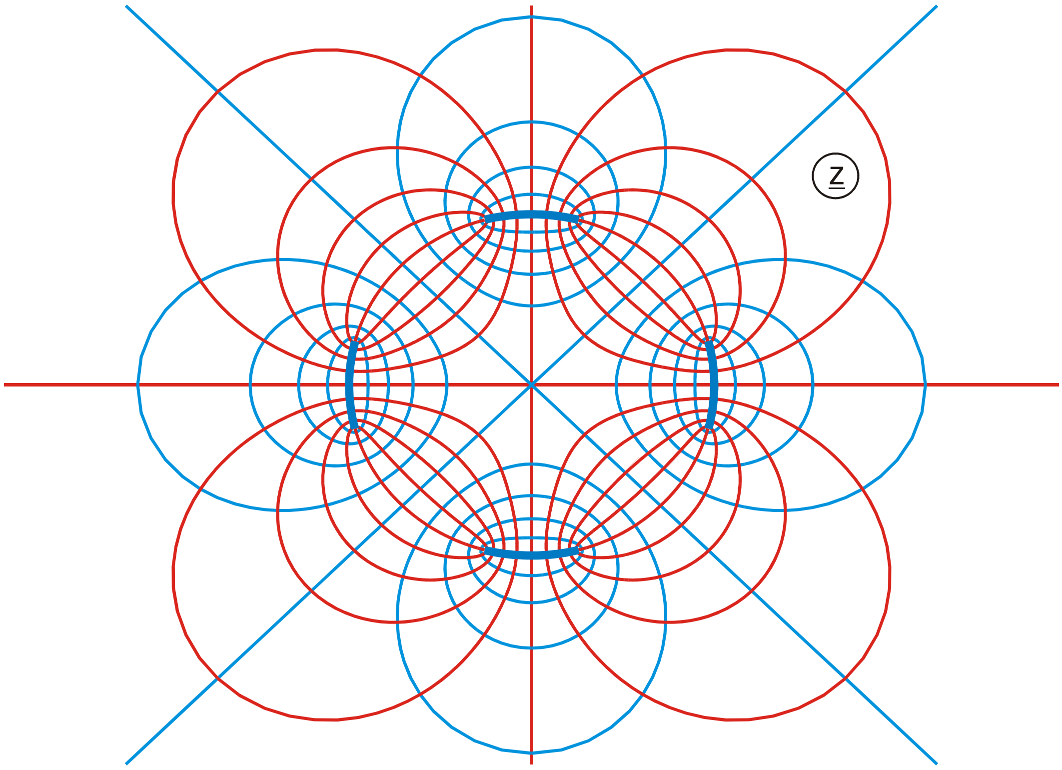
$$v_B = K'(k) - a$$

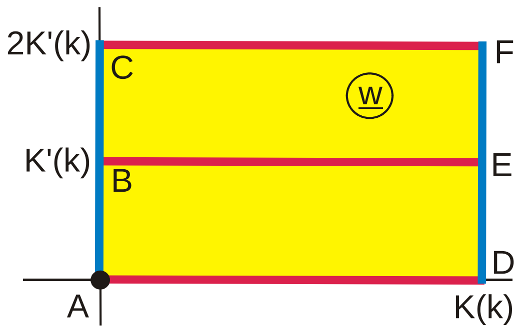
$$\varphi = \frac{2}{n} \arg \vartheta_4\left[\frac{\pi}{2K(k)}(u_F + ja), k\right]$$

$$u_F = F_a\left(\sqrt{\sigma}, k\right)$$

$$0 \le u \le K(k)$$

$$0 \le v \le K'(k)$$





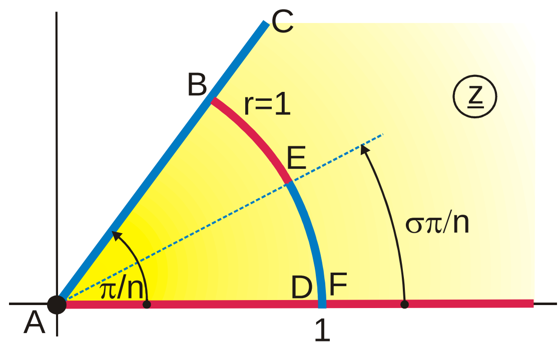


Abbildung G 5

$$z = \left(\frac{1 - w_1}{1 + w_1} \right)^{1/n}$$

$$w_1 = \mathrm{cn}(w, k)$$

$\sigma < 1$

$k = \cos(\sigma\pi/2)$

gegeben: σ, n

$0 \leq u \leq K(k)$

$0 \leq v \leq 2K'(k)$

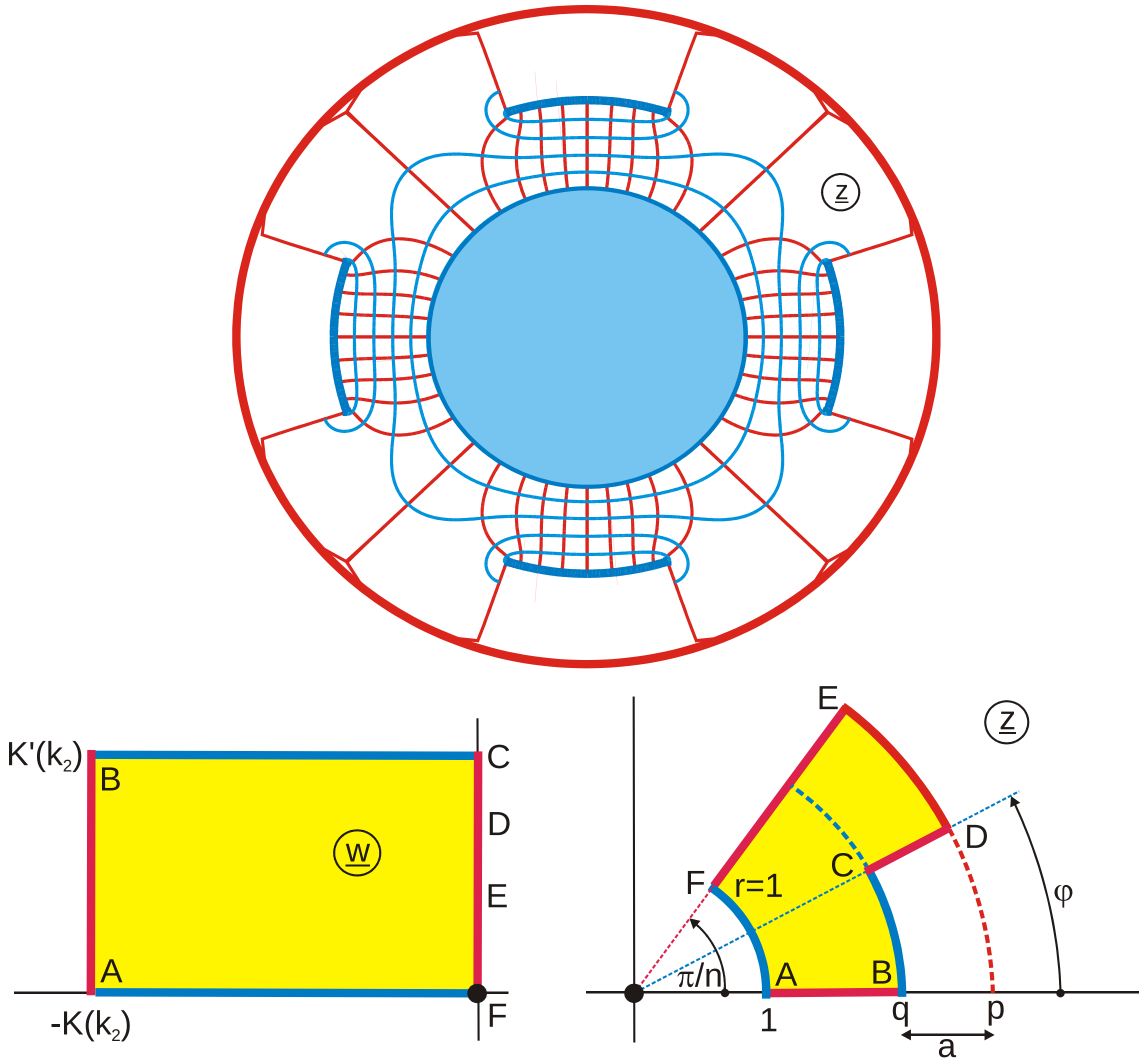


Abbildung G 6

$$z = \exp\left(-j\frac{\pi}{n}w_4\right)$$

$$w_4 = \frac{F_a(w_3, k_1) + F_a(w_3, k_1')}{K(k_1) + K'(k_1)} - 1$$

gegeben: a, n

$a = p - q$

$w_3 = \sqrt{w_2}$

$\varphi = b\pi / n$

$$w_2 = \frac{2w_1(1+k)}{(1+w_1)(1+kw_1)}$$

$w_1 = \mathrm{sn}^2(w, k)$

$$k_1 = \{\vartheta_2(0,\tau_1)/\vartheta_3(0,\tau_1)\}^2$$

$$b = 1 - \frac{n}{\pi}\ln(p-a)$$

$$\tau_1 = \frac{1-b}{1+b}$$

$$k = \left(\frac{k_1 - k_1'}{k_1 + k_1'}\right)^2$$

$-K(k_2) \le u \le 0$

$0 \le v \le K'(k_2)$ $\qquad$ $k_2 = \mathrm{sqr}(k)$

$$p = \exp\frac{\pi}{n}$$

$$q = \exp\left(\frac{1-b}{n}\pi\right)$$

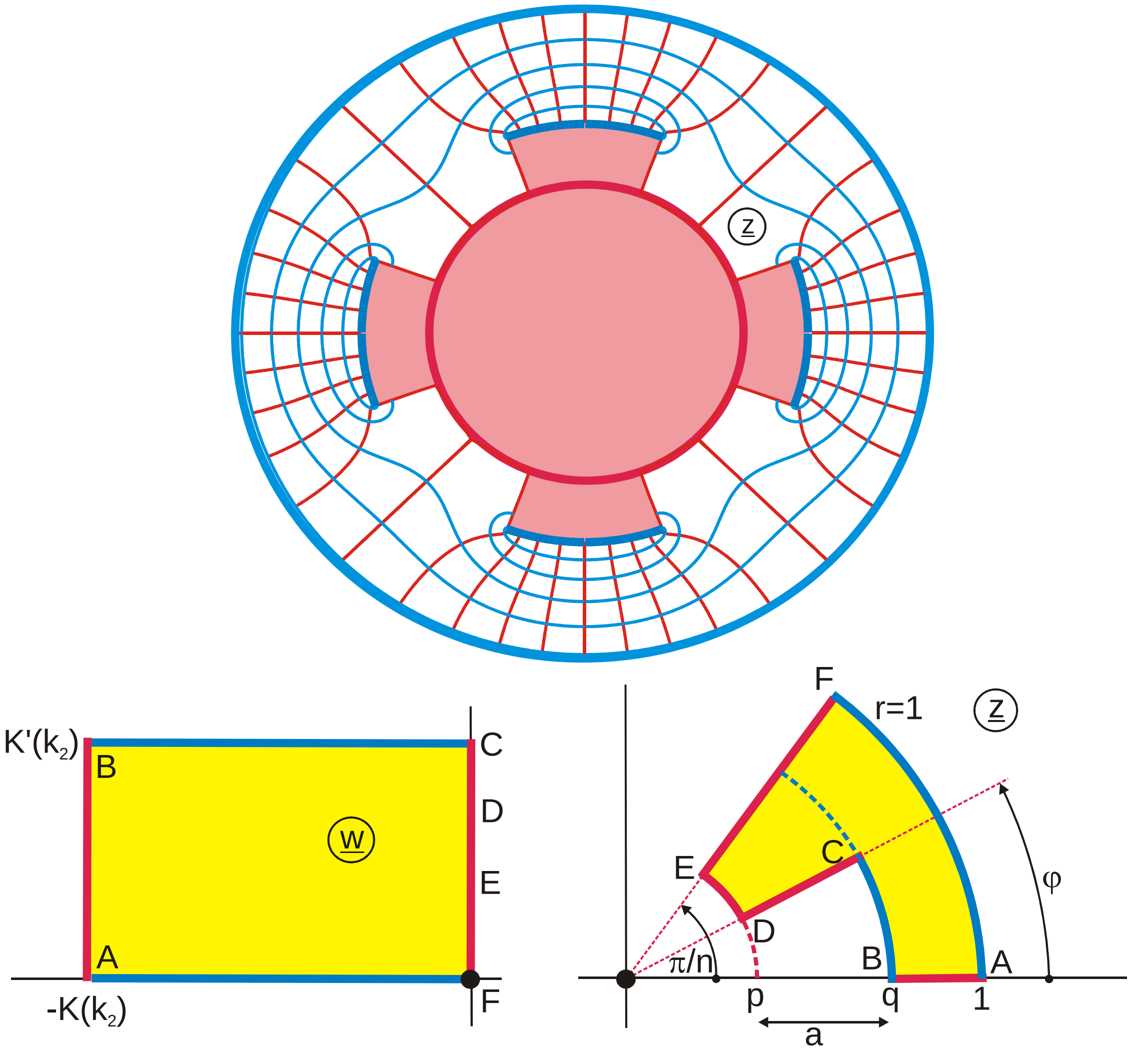


Abbildung G 6.1

$$z = \exp\left(-j\frac{\pi}{n}w_4\right)$$

$$w_4 = \frac{F_a(w_3, k_1) + F_a(w_3, k_1')}{K(k_1) + K'(k_1)} - 1$$

gegeben: a, n

$a = q - p$

$$w_3 = \sqrt{w_2}$$

$$\varphi = b\pi / n$$

$$w_2 = \frac{2w_1(1+k)}{(1+w_1)(1+kw_1)}$$

$$w_1 = \mathrm{sn}^2(w, k)$$

$$k_1 = \{\vartheta_2(0,\tau_1)/\vartheta_3(0,\tau_1)\}^2$$

$$b = 1 - \frac{n}{\pi}\ln(p+a)$$

$$\tau_1 = \frac{1-b}{1+b}$$

$$k = \left(\frac{k_1 - k_1'}{k_1 + k_1'}\right)^2$$

$-K(k_2) \le u \le 0$

$0 \le v \le K'(k_2)$ $k_2 = \mathrm{sqr}(k)$

$$p = 1\Big/\exp\frac{\pi}{n}$$

$$q = \exp\left(\frac{b-1}{n}\pi\right)$$

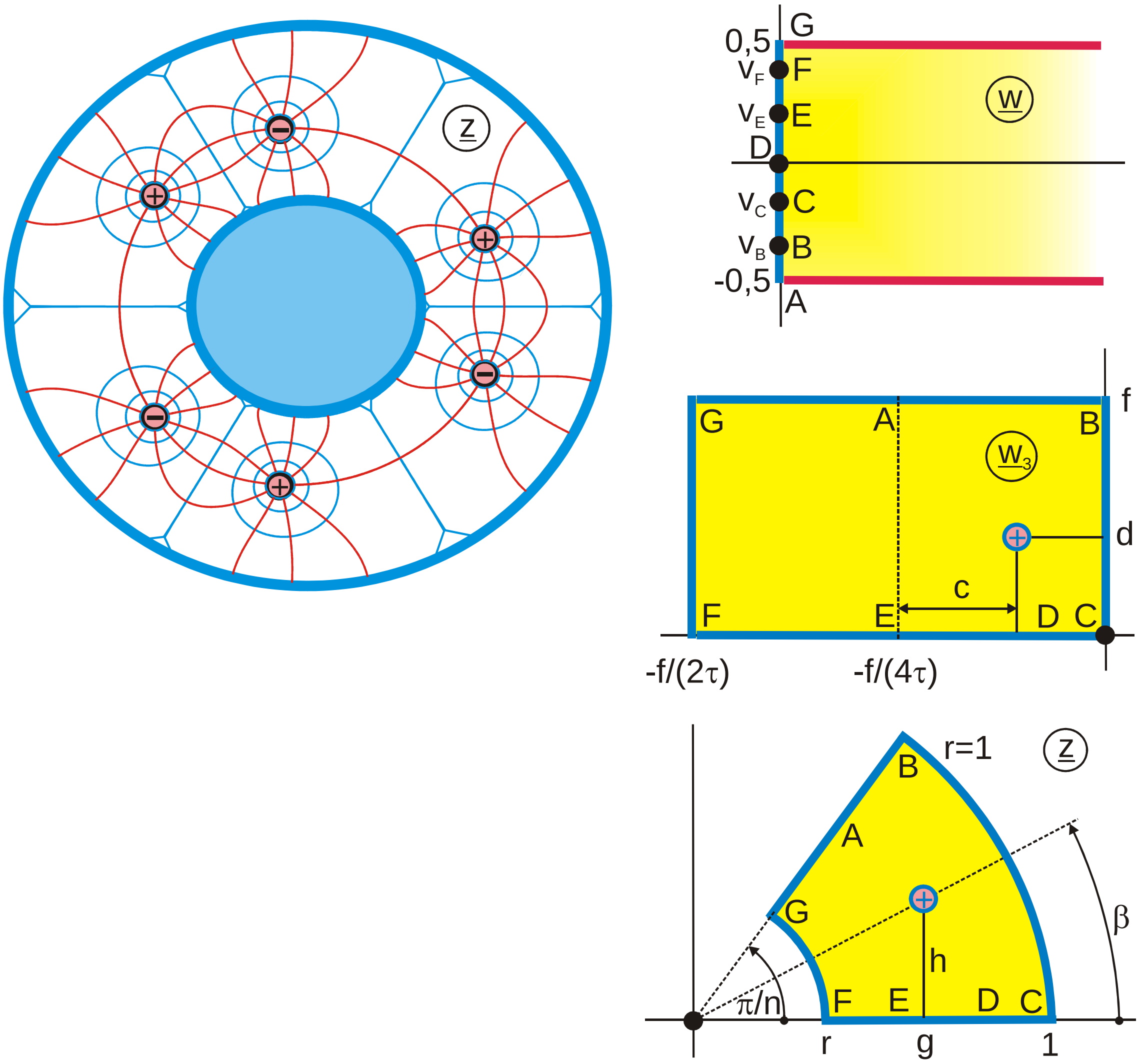


Abbildung G 7

$z = \exp\left(f\left\{w_2 - 1/\tau\right\}\right)$

$w_2 = F_a(w_1, k)/K'(k)$

$w_1 = b + ja \tanh(w\pi)$

gegeben: r, n, r_1, β

$h = r_1 \sin(\beta)$

$k = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2$

$\tau = -\dfrac{2f}{\ln r}$

$v_B = \dfrac{1}{\pi}\arctan\dfrac{b - 1/k}{a}$

$v_E = \dfrac{1}{\pi}\arctan\dfrac{b + 1}{a}$

$g = r_1 \cos(\beta)$

$\varphi = f = \pi/n$

$b + ja = \mathrm{sn}\left\{(c + jd)K'(k), k\right\}$

$c + jd = \dfrac{1}{\tau} + \dfrac{\ln(g + jh)}{f}$

$v_C = \dfrac{1}{\pi}\arctan\dfrac{b - 1}{a}$

$v_F = \dfrac{1}{\pi}\arctan\dfrac{b + 1/k}{a}$

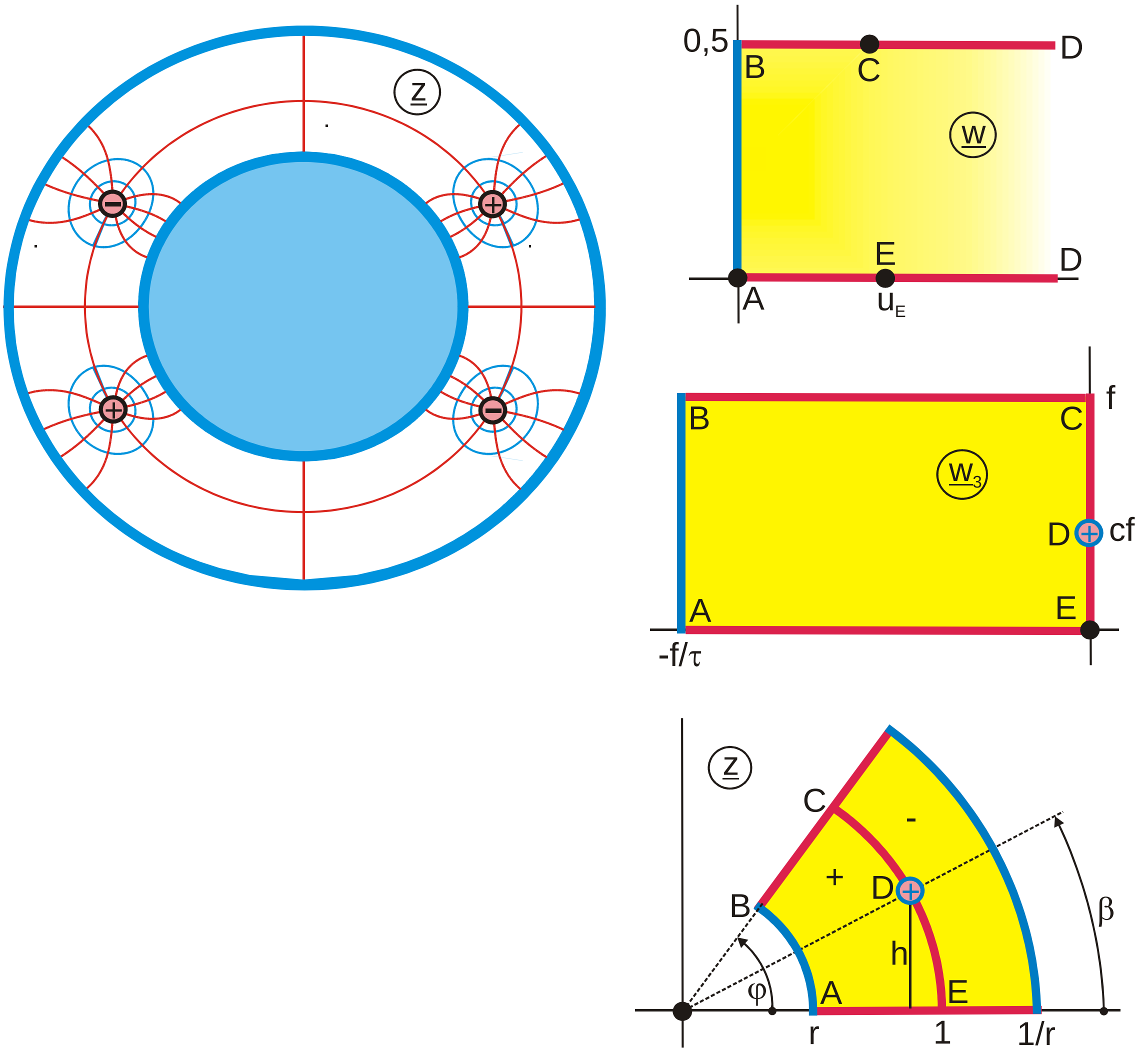


Abbildung G 7.1

$$z = \exp\left(\pm f\left\{w_2 - 1/\tau\right\}\right)$$

$$w_2 = F_a(w_1, k)/K'(k)$$

$$w_1 = a \tanh(w\pi)$$

gegeben: r, n, β

$$c = \beta/f$$

$$h = \sin(\beta) \qquad \varphi = f = 2\pi/n$$

$$k = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2 \qquad a = \operatorname{Re} \operatorname{sn}\left\{K(k) + jc\,K'(k), k\right\}$$

$$\tau = -\frac{f}{\ln r}$$

$$u_C = \frac{1}{\pi} \operatorname{ar\,tanh}(ak) \qquad u_E = \frac{1}{\pi} \operatorname{ar\,tanh} \frac{1}{a}$$

$$0 \le u \le 0{,}3 \qquad 0 \le v \le 0{,}5$$

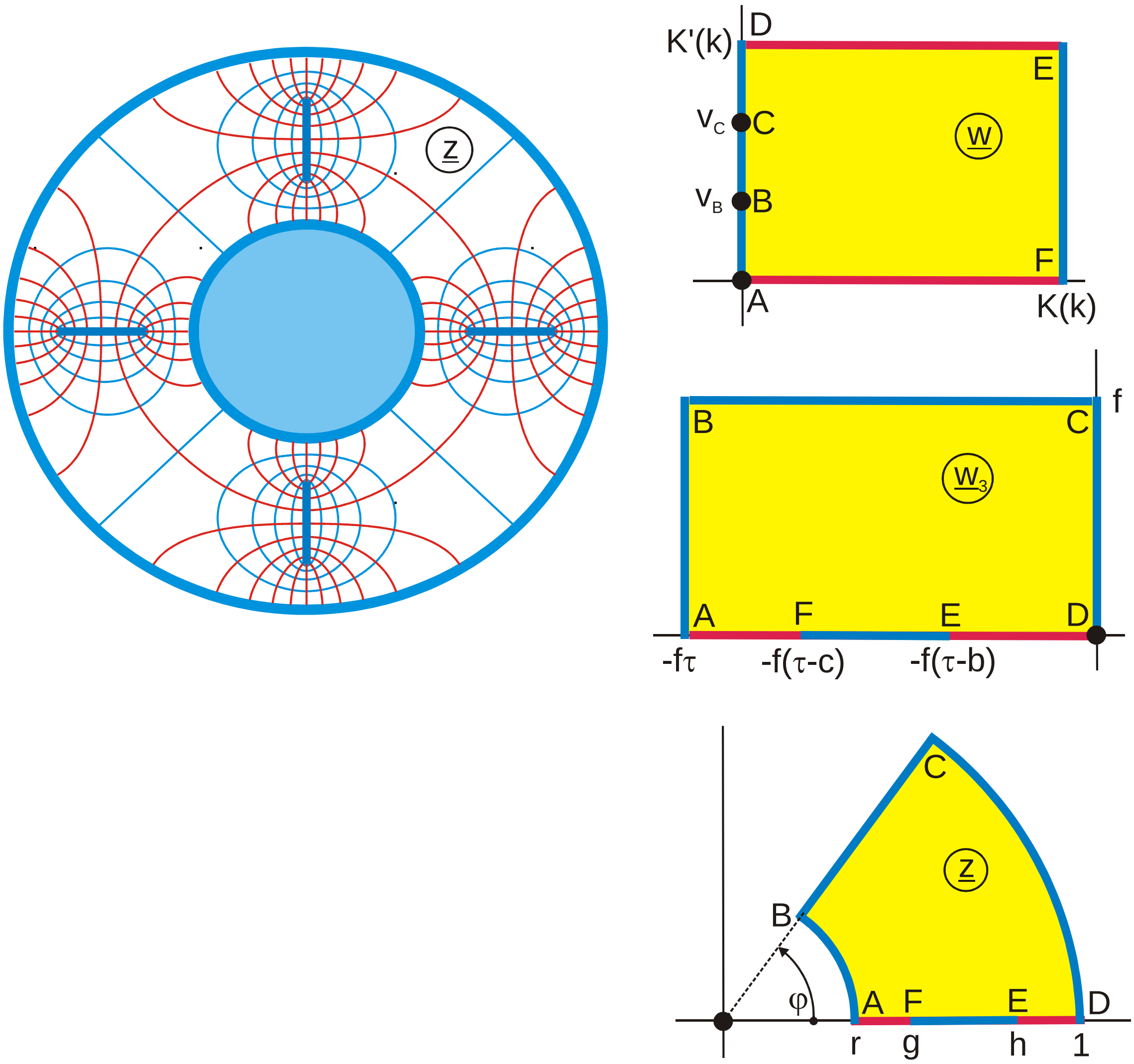


Abbildung G 7.2

$z = \exp\left(f\left\{w_2 - \tau\right\}\right)$

$w_2 = -j F_a(w_1, k_1)/K'(k_1)$

$w_1 = ja\ \mathrm{sn}\ (w,k)$

gegeben: r, n, g, h

$b = \tau + \dfrac{\ln h}{f}$

$c = \tau + \dfrac{\ln g}{f}$

$\varphi = f = \pi / n$

$\tau = -\dfrac{\ln r}{f}$

$k_1 = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2$

$a = \mathrm{Im}\ \mathrm{sn}\left\{jc\ K(k_1), k_1\right\}$

$k = a / \mathrm{Im}\ \mathrm{sn}\left\{jb\ K(k_1), k_1\right\}$

$v_C = \mathrm{Im}\ F_a\left[j/(ak_1), k\right]$

$v_B = \mathrm{Im}\ F_a\left[j/a, k\right]$

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

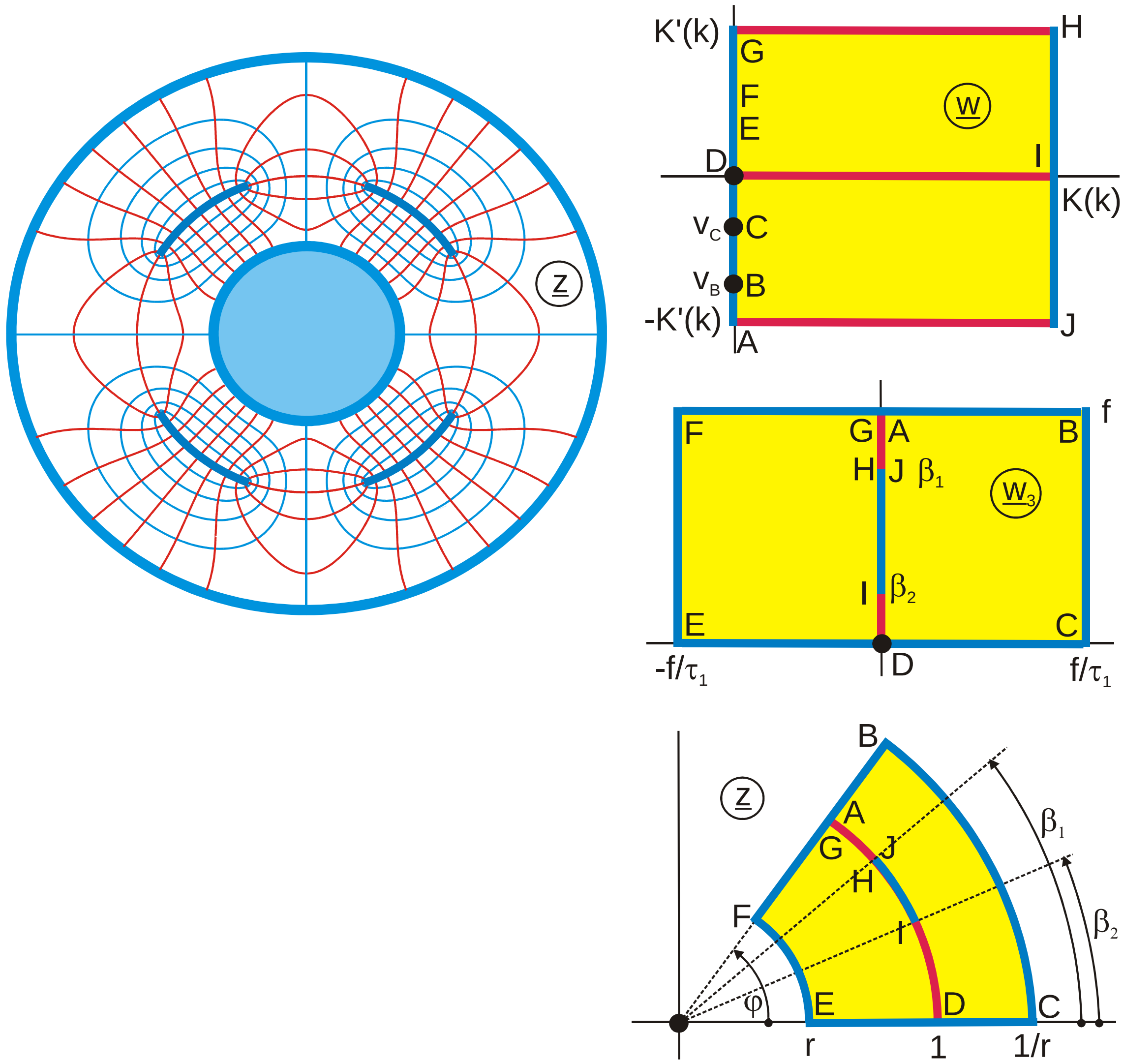


Abbildung G 7.3

$$z = \exp \frac{f\, w_2}{K'(k_1)}$$

$$w_2 = F_a(w_1, k_1)$$

$$w_1 = ja\ \mathrm{sn}\ (w,k)$$

gegeben: r, n, β_1, β_2

$$b = \frac{\beta_1}{f}$$

$$c = \frac{\beta_2}{f}$$

$$\varphi = f = \pi / n$$

$$\tau = -\frac{f}{\ln r}$$

$$k_1 = \{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\}^2$$

$$a = \mathrm{Im\,sn}\{jc\, K'(k_1), k_1\}$$

$$k = a / \mathrm{Im\,sn}\{jb\, K'(k_1), k_1\}$$

$$v_F = -v_B = \mathrm{Im}\, F_a\left[j/(ak_1), k\right]$$

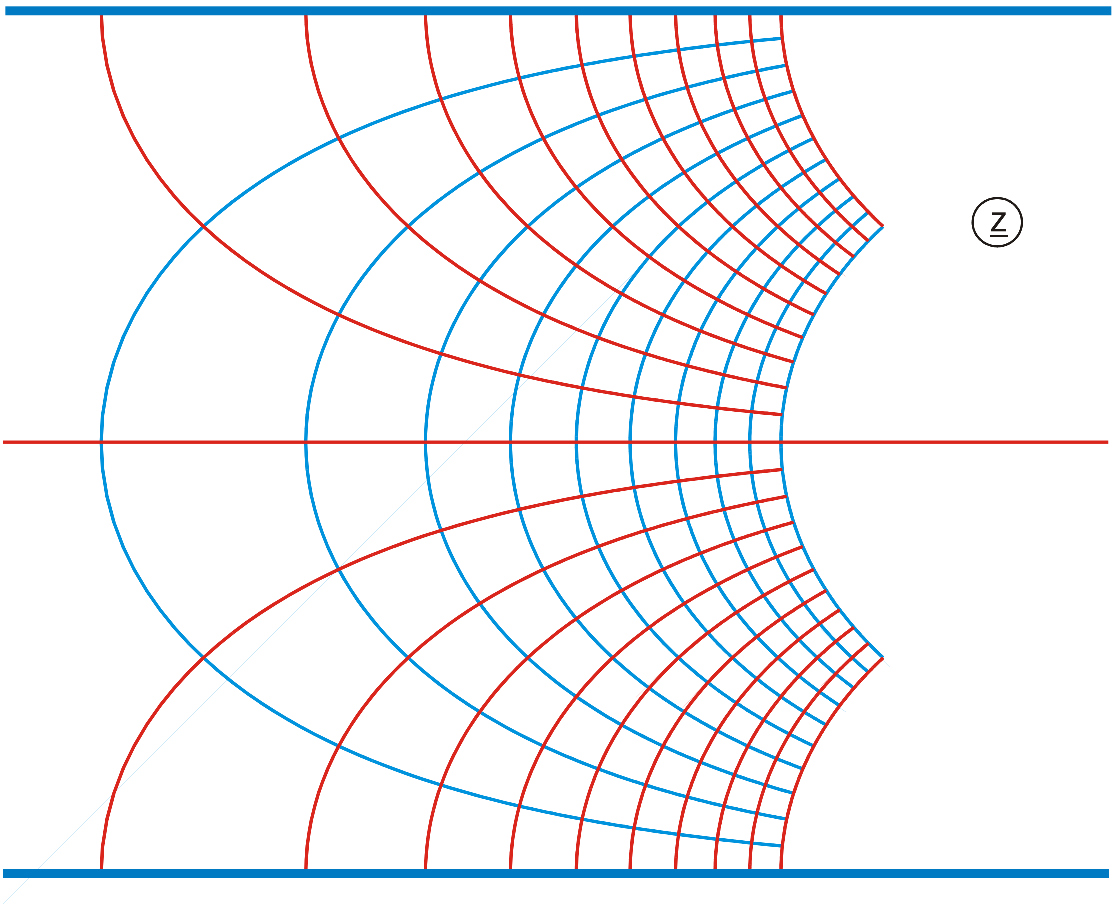
$$v_E = -v_C = \mathrm{Im}\, F_a\left[j/a, k\right]$$

$$0 \le u \le K(k)$$

$$-K'(k) \le v \le K'(k)$$

Abbildungen Gruppe H

Einfach periodische Feldbilder



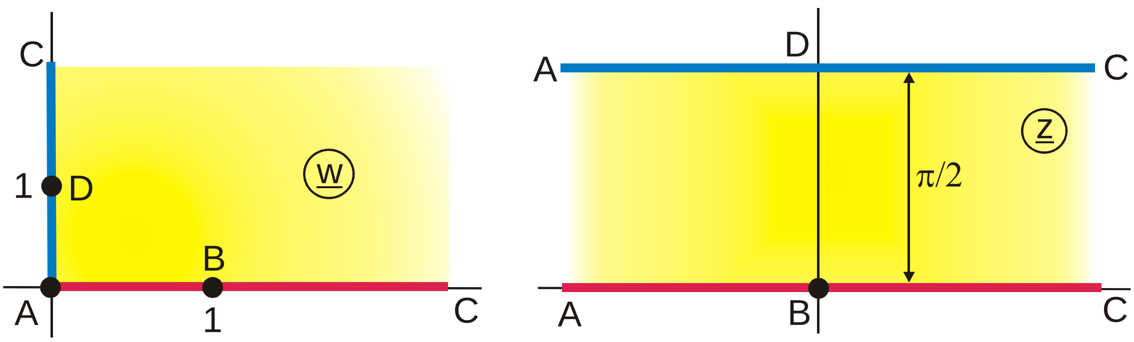


Abbildung H 1

$z = \ln w$

$0 \leq u \leq 2{,}5$ $\quad$ $0 \leq v \leq 2{,}5$

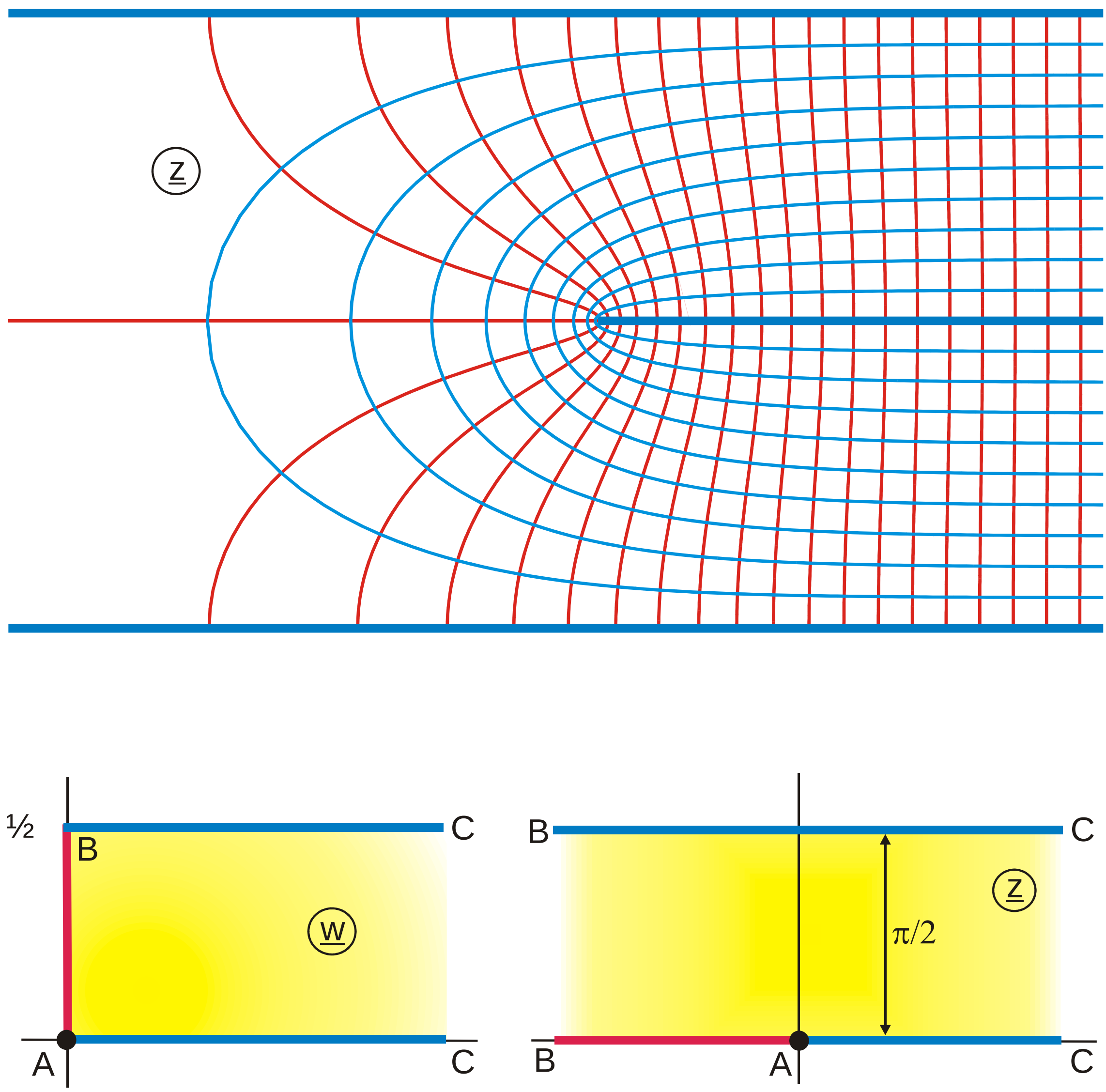


Abbildung H 1.1

$z = \ln \cosh (w\pi)$

$0 \leq u \leq 1{,}5$

$0 \leq v \leq 0{,}5$

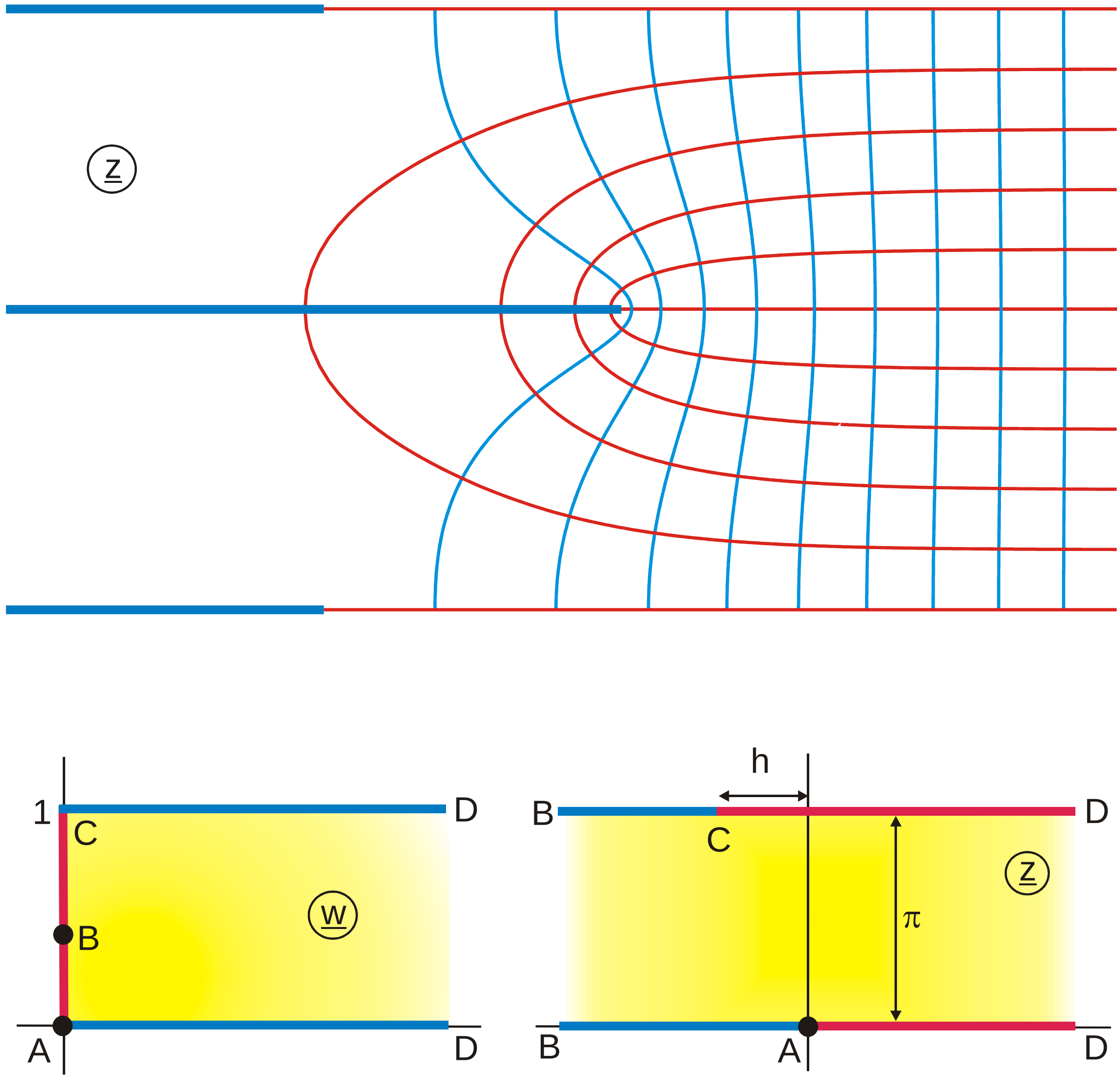


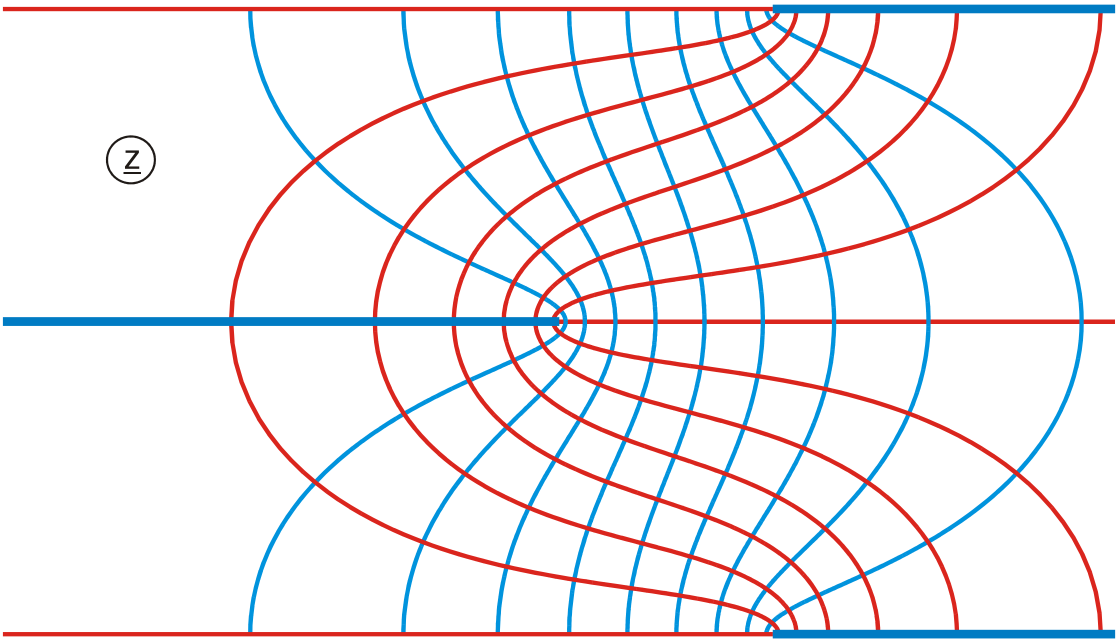
Abbildung H 1.2

$$z = \ln \frac{\cosh(w\pi) + a}{1 + a}$$

$$\mathrm{a} = \frac{\exp(\mathrm{h}) - 1}{\exp(\mathrm{h}) + 1} \qquad \mathrm{h} = \ln \frac{1 - \mathrm{a}}{1 + \mathrm{a}}$$

$$0 \le a \le 1 \qquad v_B = \frac{1}{\pi} ar\cosh(-a)$$

$$0 \le \mathrm{u} \le 2 \qquad 0 \le \mathrm{v} \le 1$$



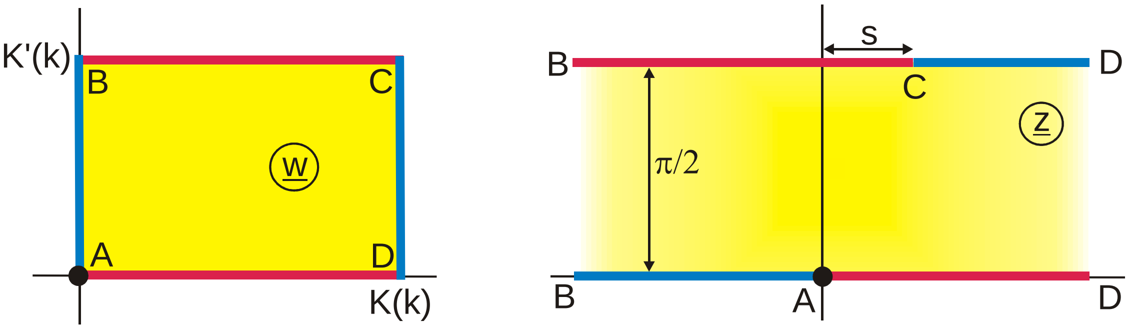
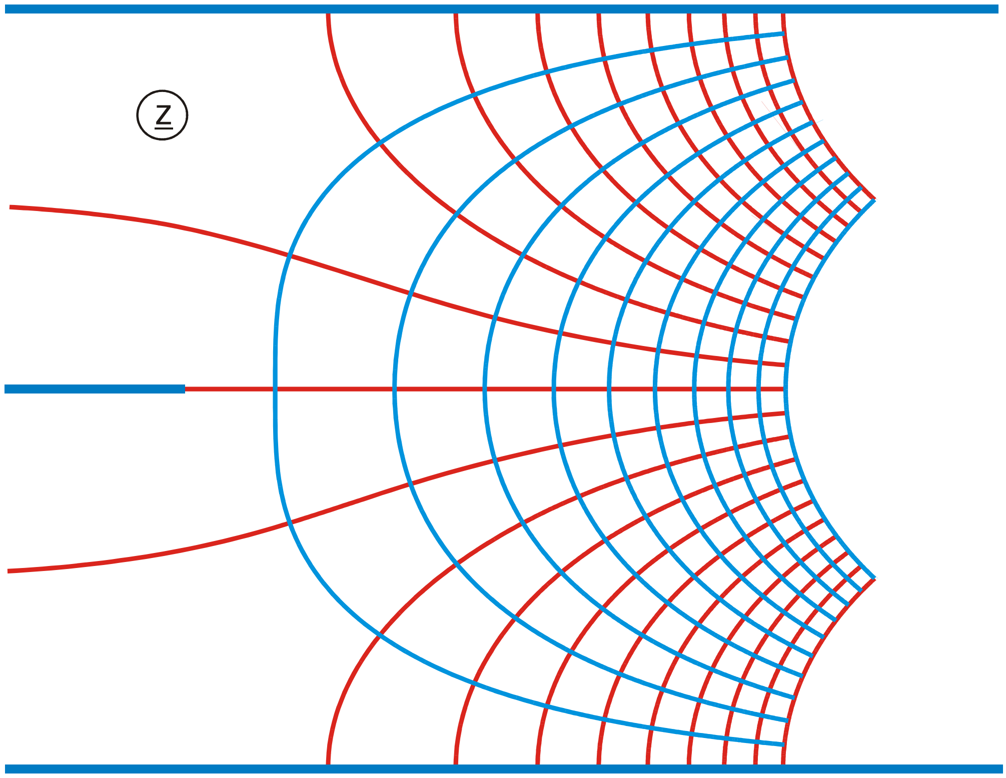


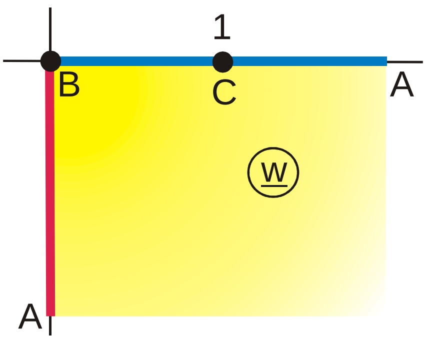
Abbildung H 1.3

$$z = -\ln \operatorname{cn}(w,k)$$

$$k = \sqrt{\frac{1}{\exp(-2s)+1}}$$

$0 \leq u \leq K(k)$ $0 \leq v \leq K'(k)$





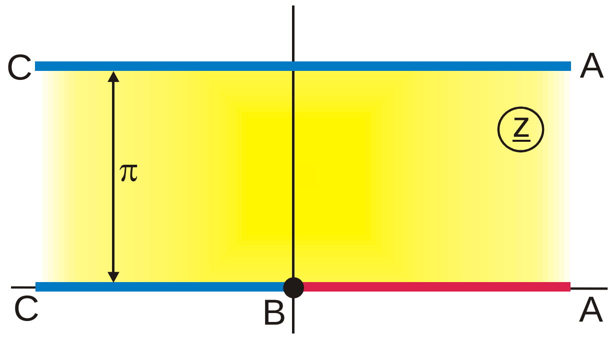


Abbildung H 1.4

$z = \ln(1 - w^2)$

$0 \leq u \leq 10$ $-10 \leq v \leq 0$

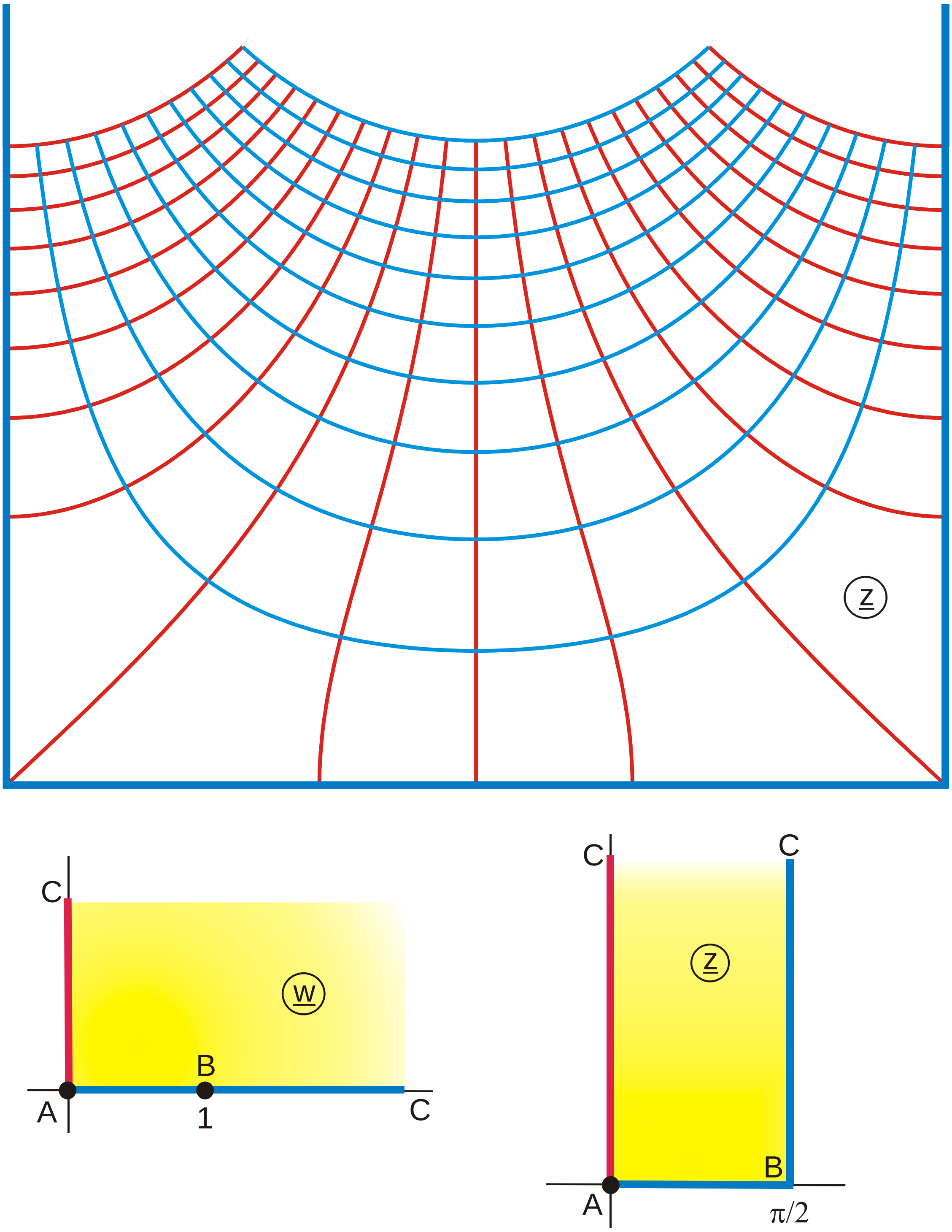


Abbildung H 1.5

$z = \arcsin w$

$0 \leq u \leq 5$

$0 \leq v \leq 5$

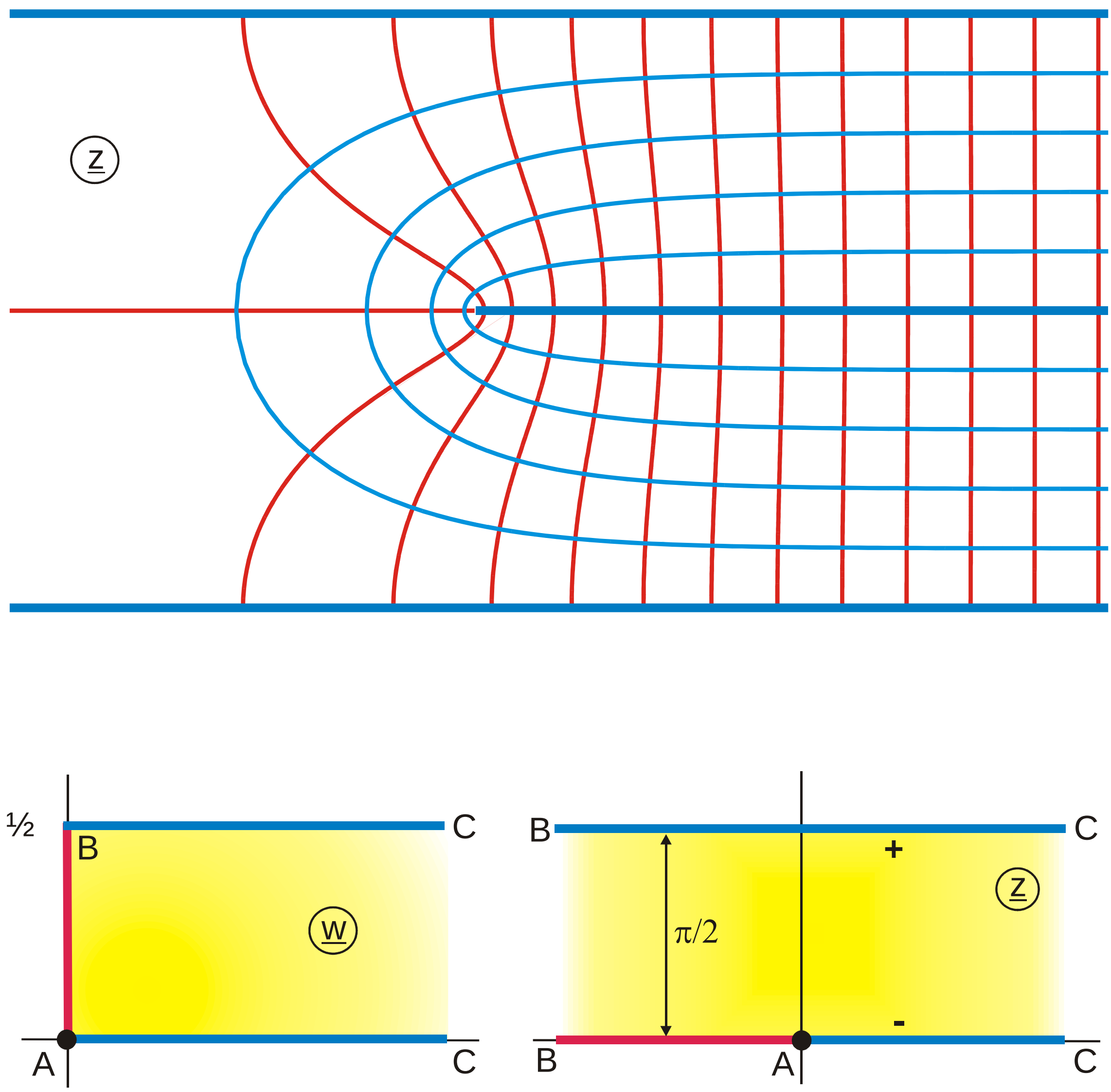
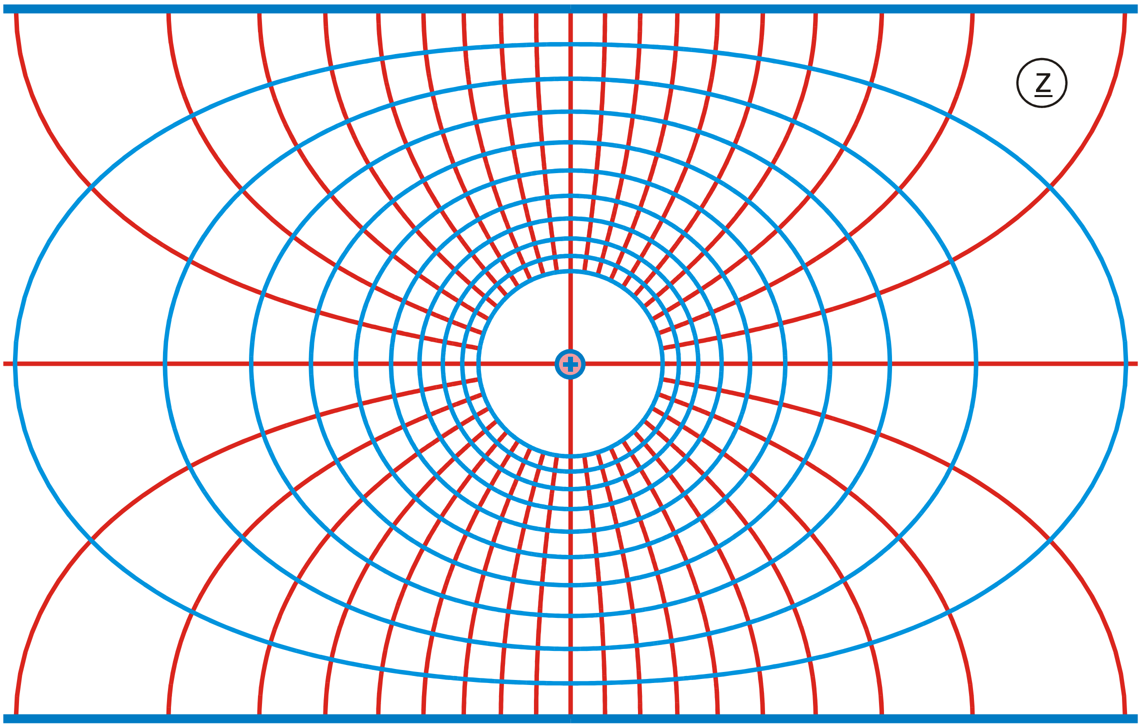
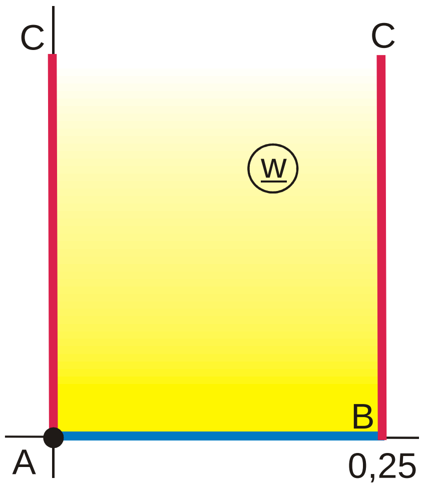


Abbildung H 1.6

$z = \ln \cosh(w\pi)$

$0 \leq u \leq 1{,}5$ $0 \leq v \leq 0{,}5$





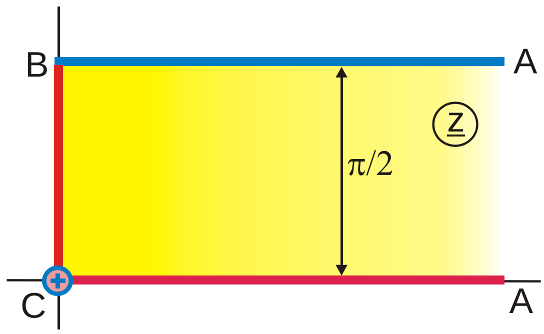
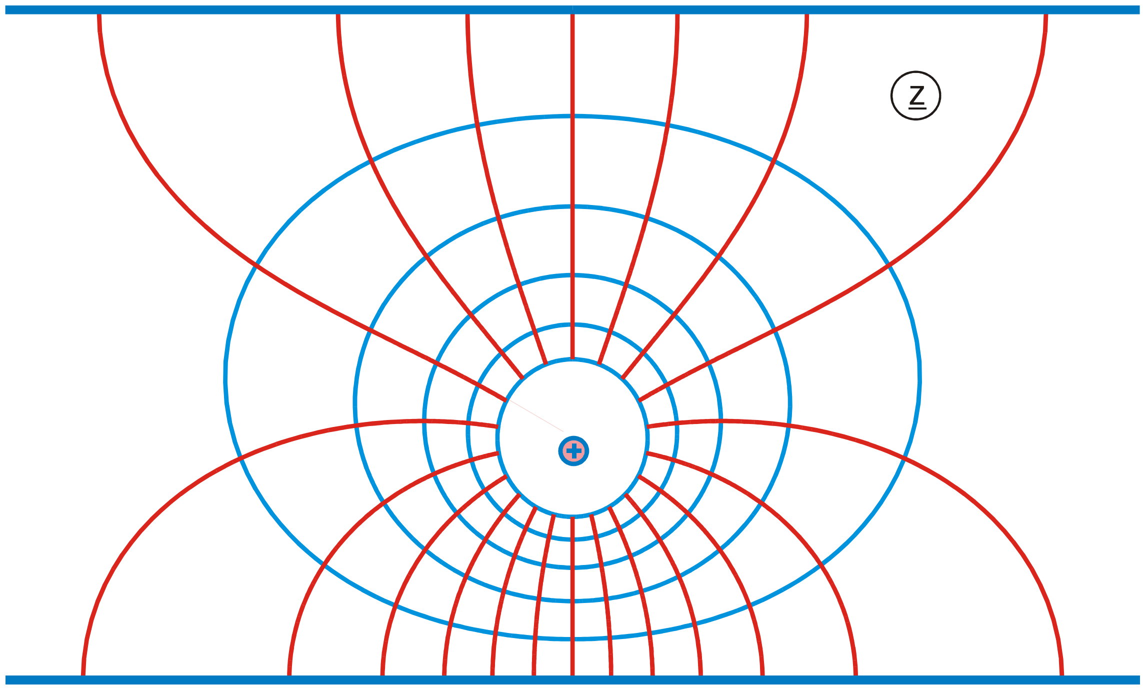


Abbildung H 2

$$z = j\frac{\pi}{2} - \ln\tan(w\pi)$$

$0 \leq u \leq 0{,}25$ $0 \leq v \leq 0{,}25$



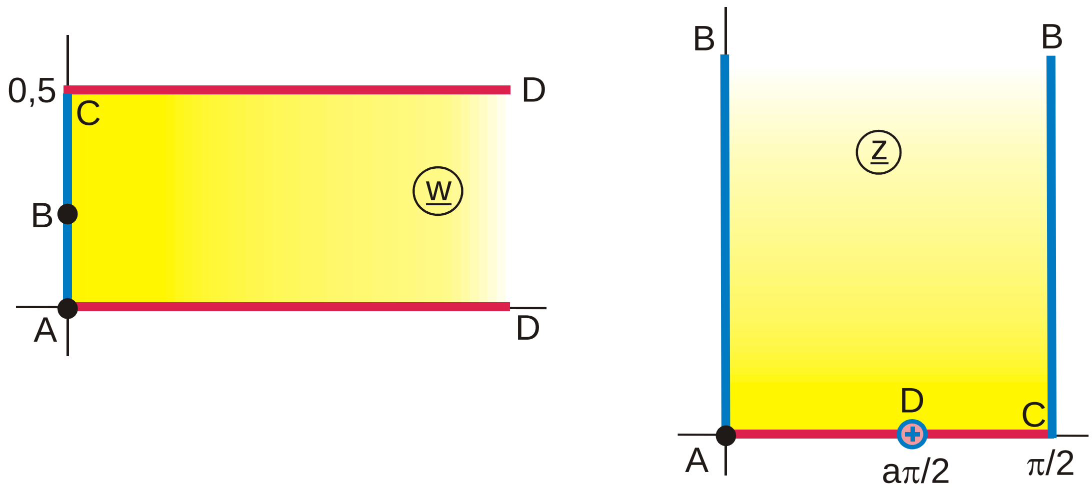


Abbildung H 2.1

$$z = \arctan\left\{\frac{w_1 - 1}{w_1 + 1}\tan\frac{a\pi}{2}\right\}$$

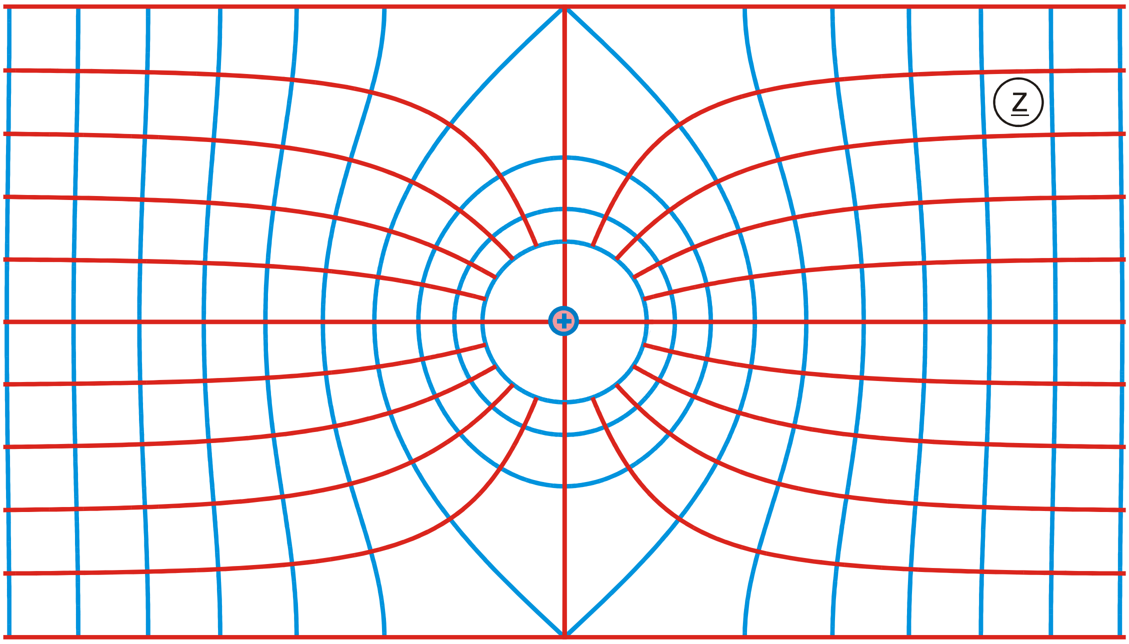
$$w_1 = \exp(2\pi w)$$

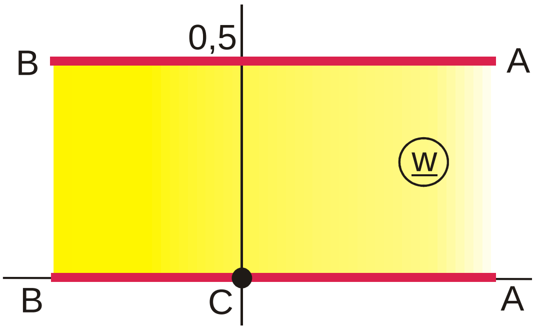
$a < 1$

$$v_B = \frac{1-a}{2}$$

$0 \le u \le 0{,}25$

$0 \le v \le 0{,}5$





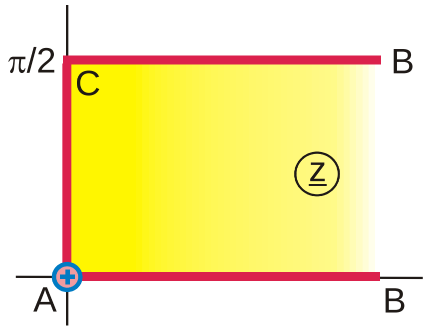


Abbildung H 2.2

$$z = j\arcsin\{\exp(-\pi w)\}$$

-0,7 ≤ u ≤ 0,3 0 ≤ v ≤ 0,5

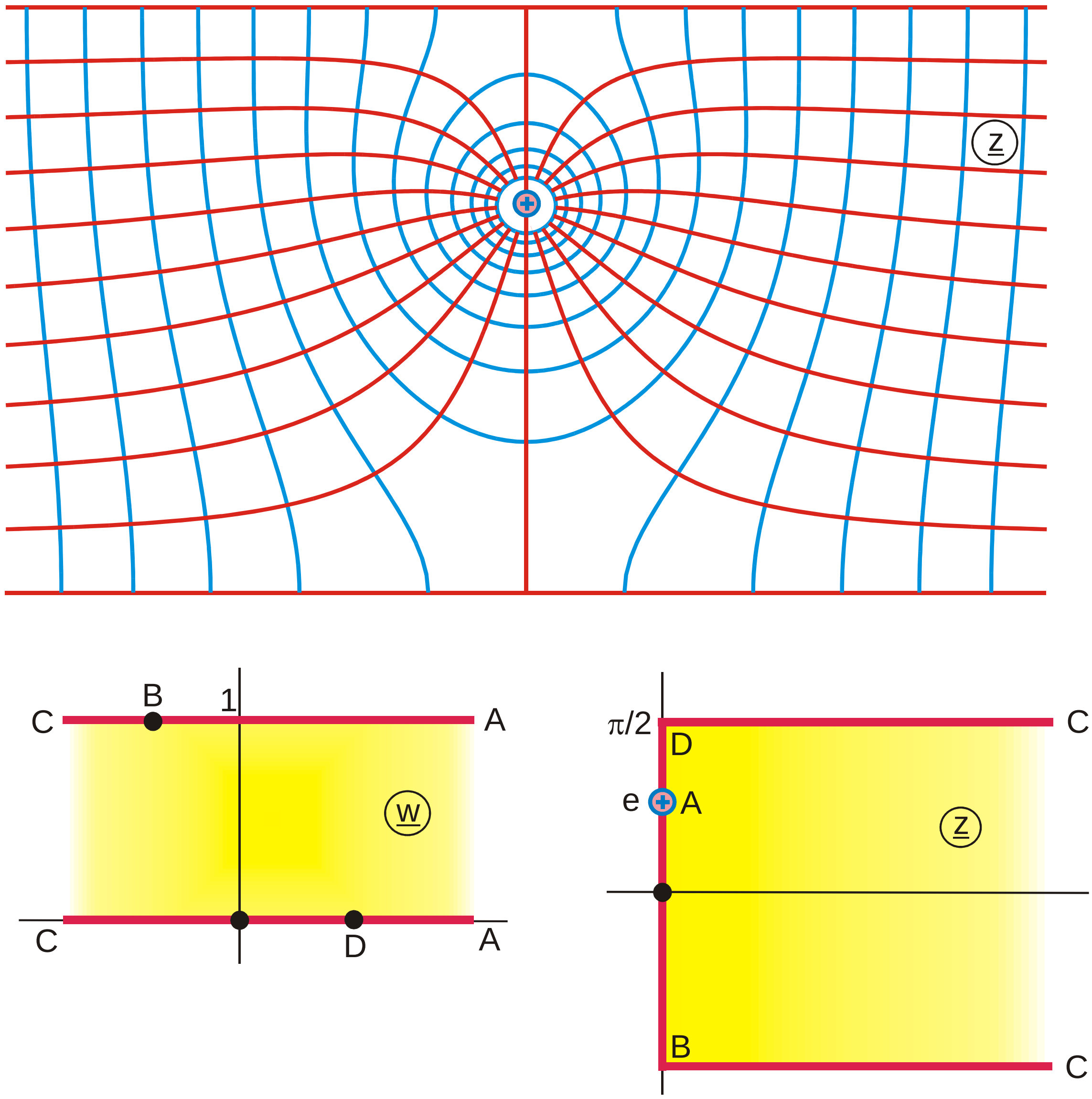
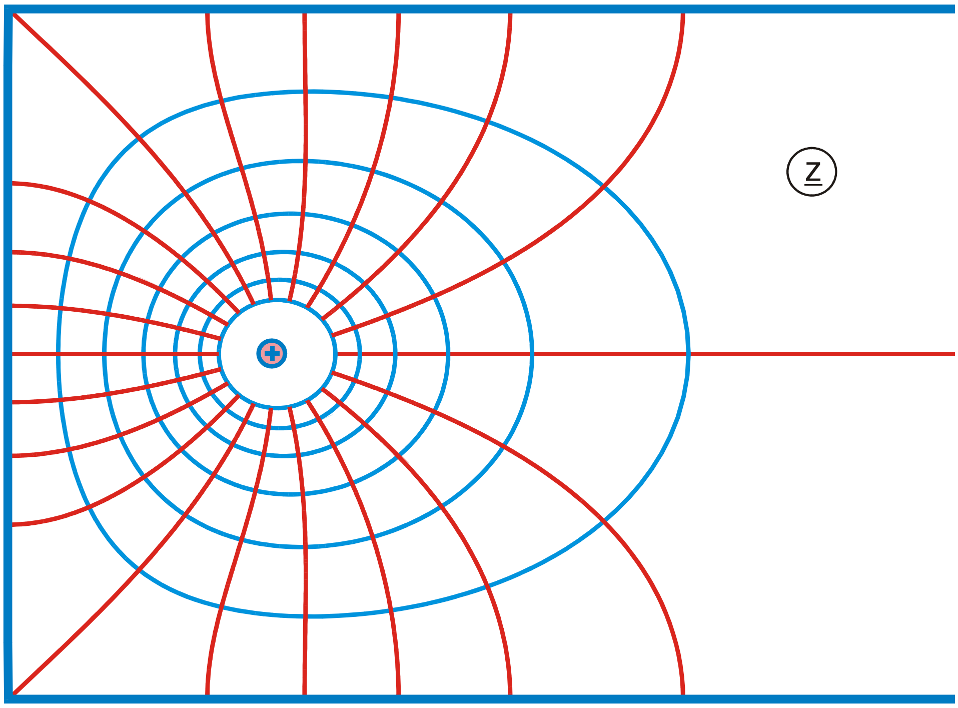


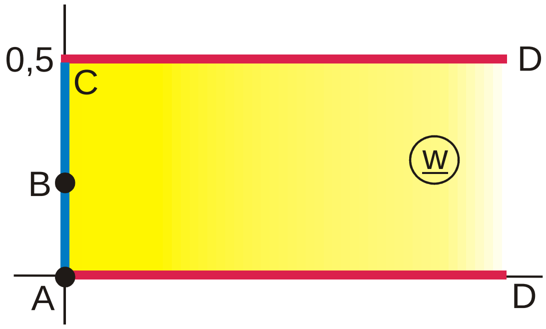
Abbildung H 2.3

$z = j \arcsin\{\exp(-\pi w) + \sigma\}$

$\sigma = \sin e$ $e = \arcsin \sigma$

$0 \le v \le 1$





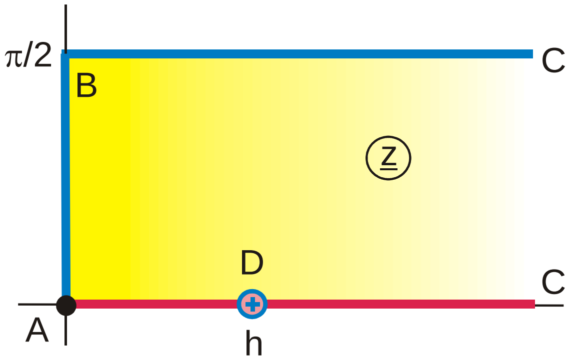


Abbildung H 3

$$z = \operatorname{arsinh}\{a \tanh(\pi w)\}$$

a = sinh h

$$v_B = \frac{1}{\pi}\arctan\frac{1}{a}$$

$0 \le u \le 0{,}3$ $0 \le v \le 1/2$

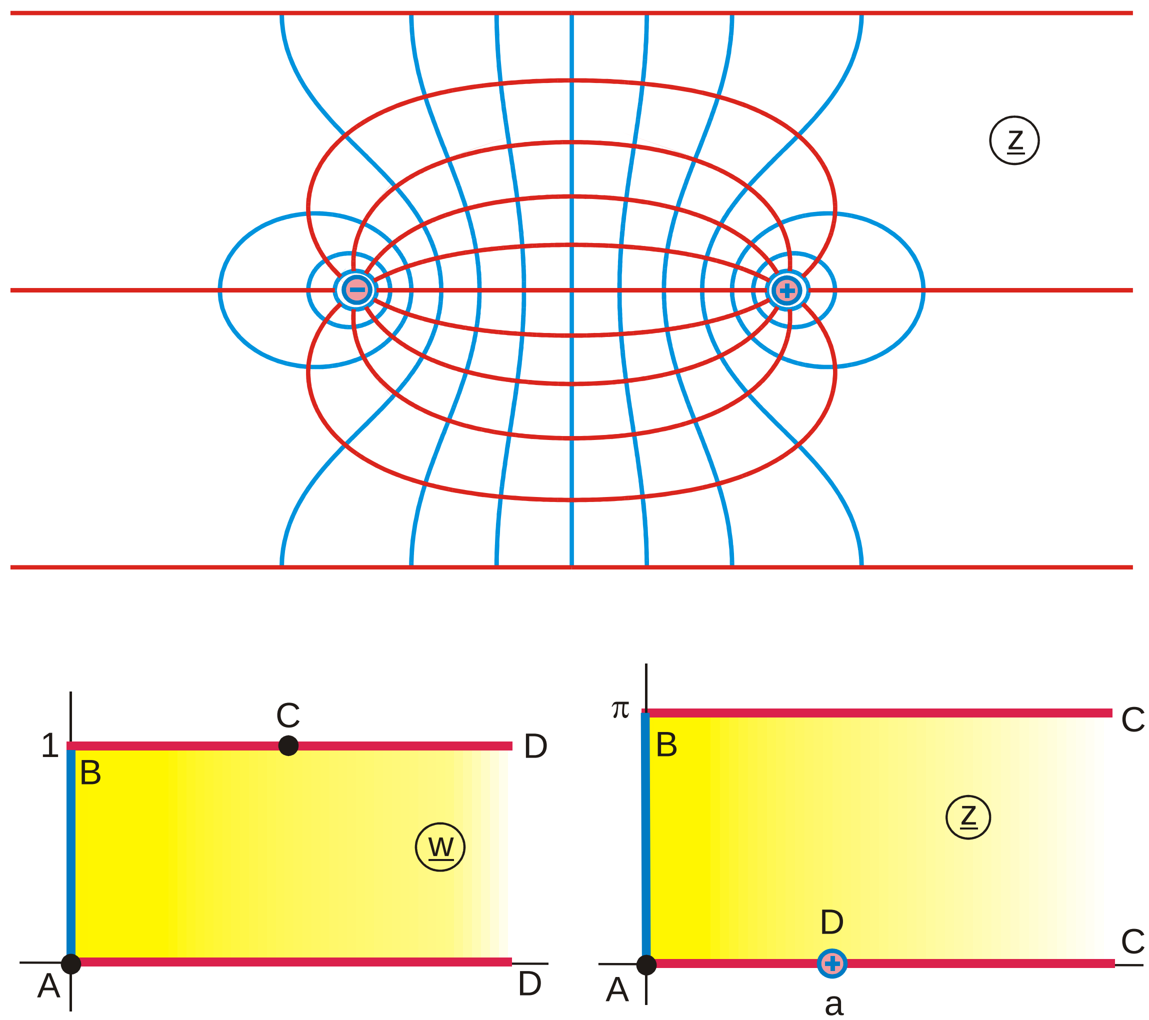


Abbildung H 3.1

$$z = \ln \frac{\sigma + w_1}{1 + \sigma w_1}$$

$w_1 = \exp(\pi w)$

$\sigma = \exp(-a)$

$$u_C = \frac{1}{\pi} \ln \frac{1}{\sigma}$$

$0 \leq u \leq 1$ $0 \leq v \leq 1$

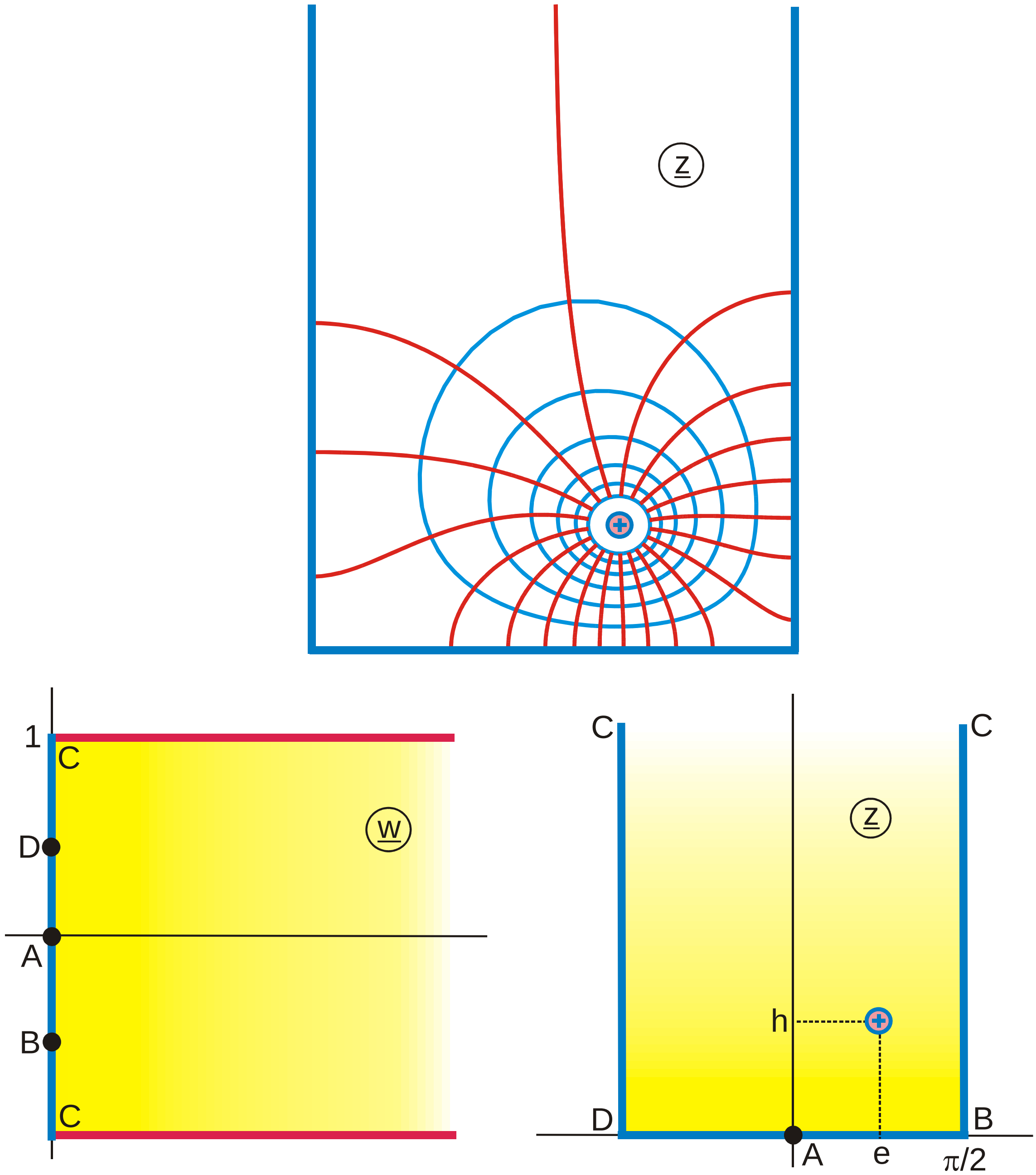


Abbildung H 3.2

$z = \arcsin w_1$

$w_1 = jb\dfrac{w_0 - 1}{w_0 + 1} + a$

$w_0 = \exp(\pi w)$

$a + jb = \sin(e + jh)$ mit $e < \pi/2$

$v_B = \dfrac{2}{\pi}\arctan\dfrac{a-1}{b} < 0$

$v_D = \dfrac{2}{\pi}\arctan\dfrac{a+1}{b}$

$0 \le u \le 0{,}6$

$-1 \le v \le 1$

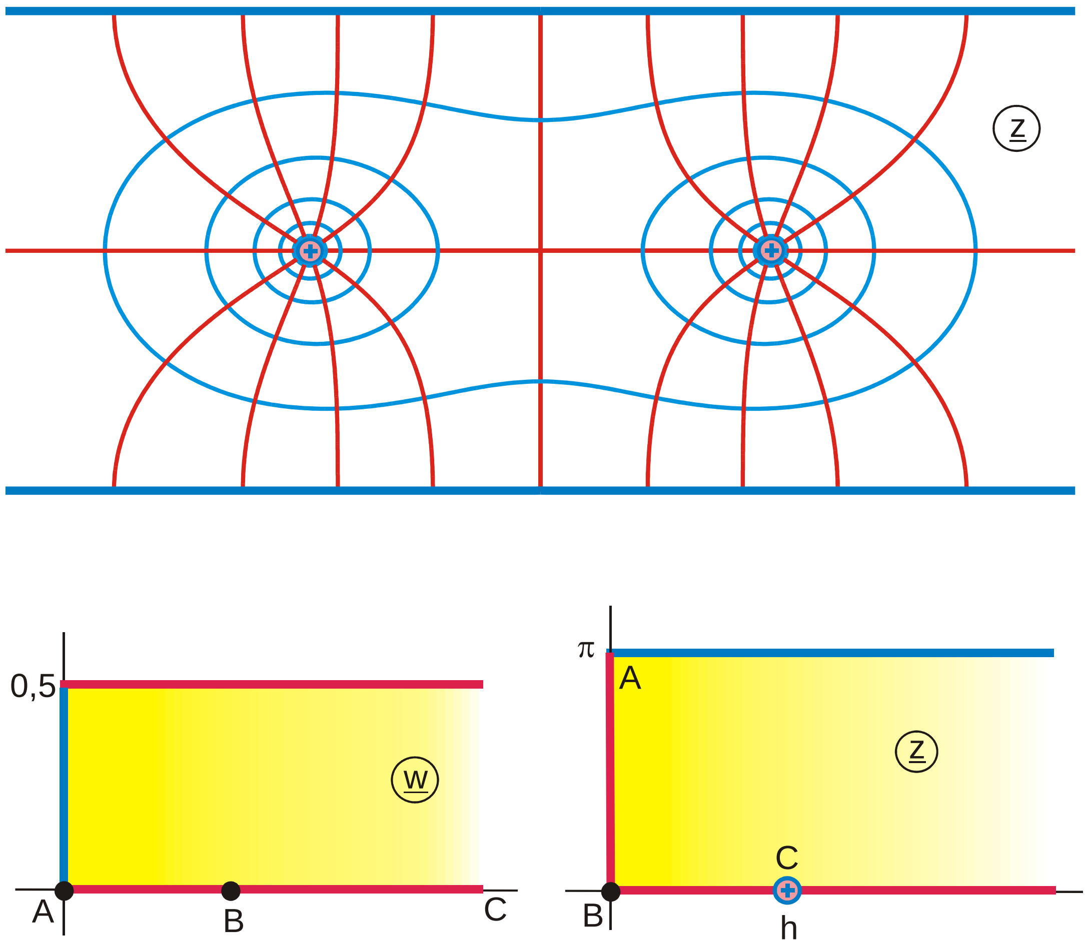


Abbildung H 3.3

$$z = j\left(\frac{\pi}{2} - \arcsin w_2\right)$$

$w_2 = (1+a)w_1 - 1$

$w_1 = \tanh^2(\pi w)$

a = cosh h

$$u_B = \frac{1}{\pi} ar\tanh\sqrt{\frac{2}{1+a}}$$

$0 \le u \le 0{,}5$

$0 \le v \le 0{,}5$

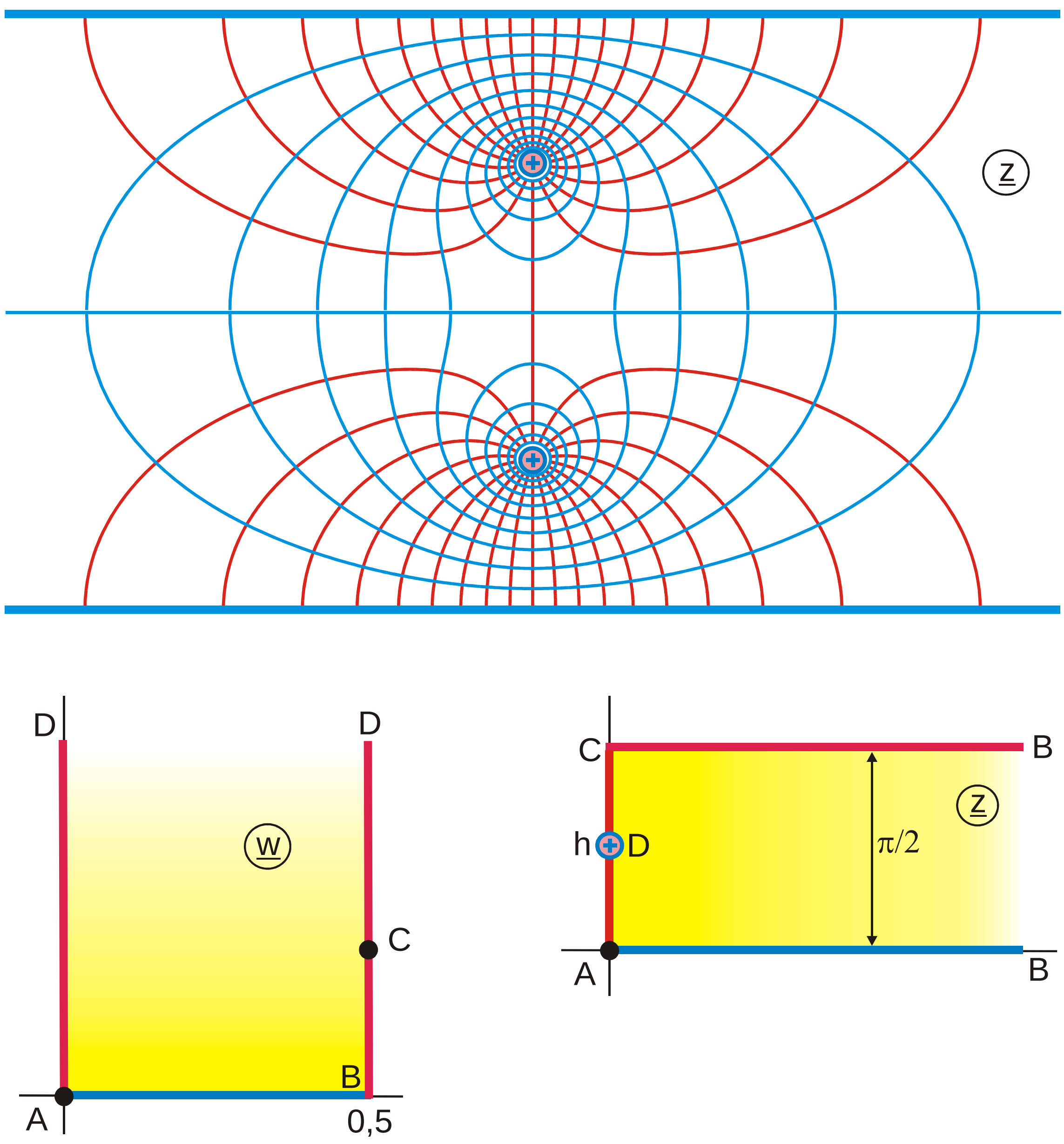


Abbildung H 3.4

$$z = ar\sinh\{a\tan(w\pi)\}$$

a = sin h

$$v_C = \frac{1}{\pi}\,\text{artanh}\,a$$

$0 \le u \le 0{,}5$

h = arsinh(ja)

$$v_D = \frac{1}{\pi}\arctan\frac{1}{a}$$

$0 \le v \le 0{,}5$

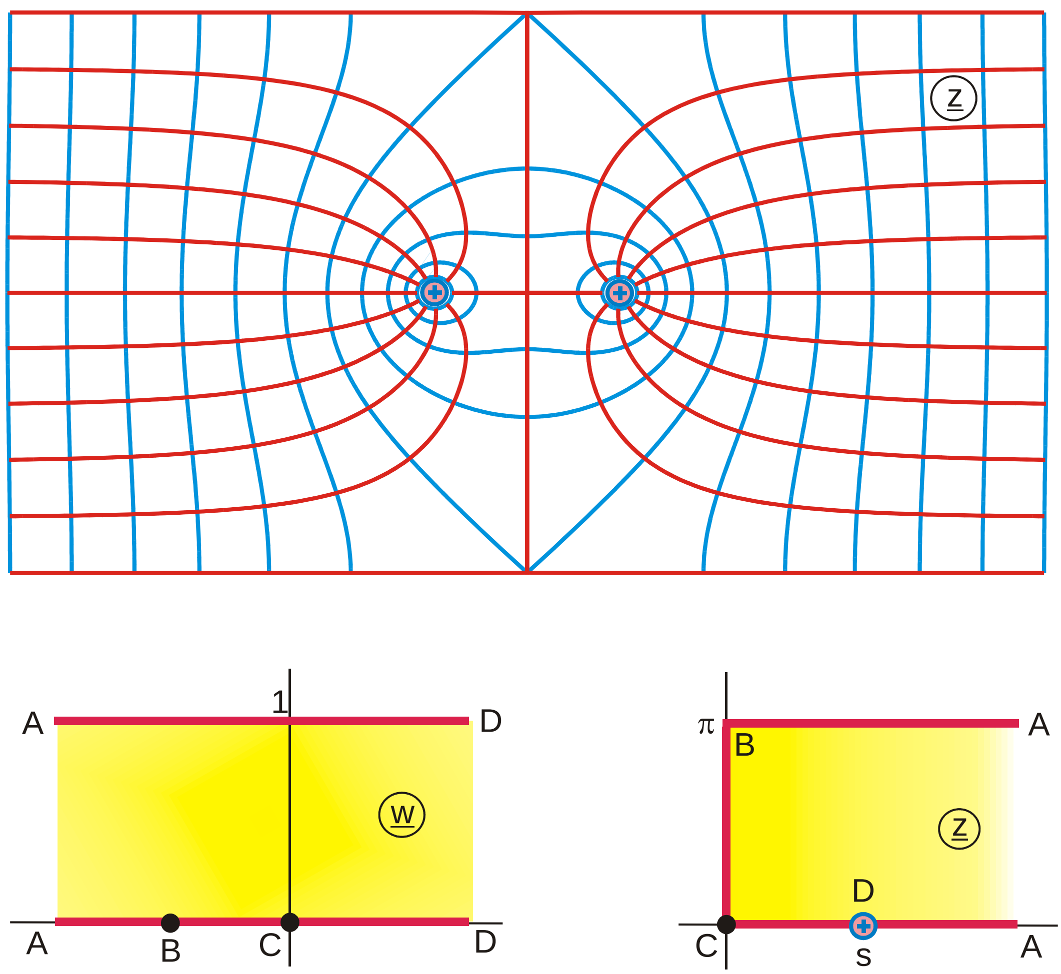


Abbildung H 3.5

$$z = ar\tanh w_1$$

$$w_1 = \sqrt{\frac{w_0 - 1}{b^2 w_0 - 1}}$$

$w_0 = \exp(\pi w)$

s = artanh(1/b)

b = 1/tanh s

$$u_B = -\frac{2}{\pi}\ln b$$

$-1{,}7 \leq u \leq 0{,}3$

$0 \leq v \leq 1$

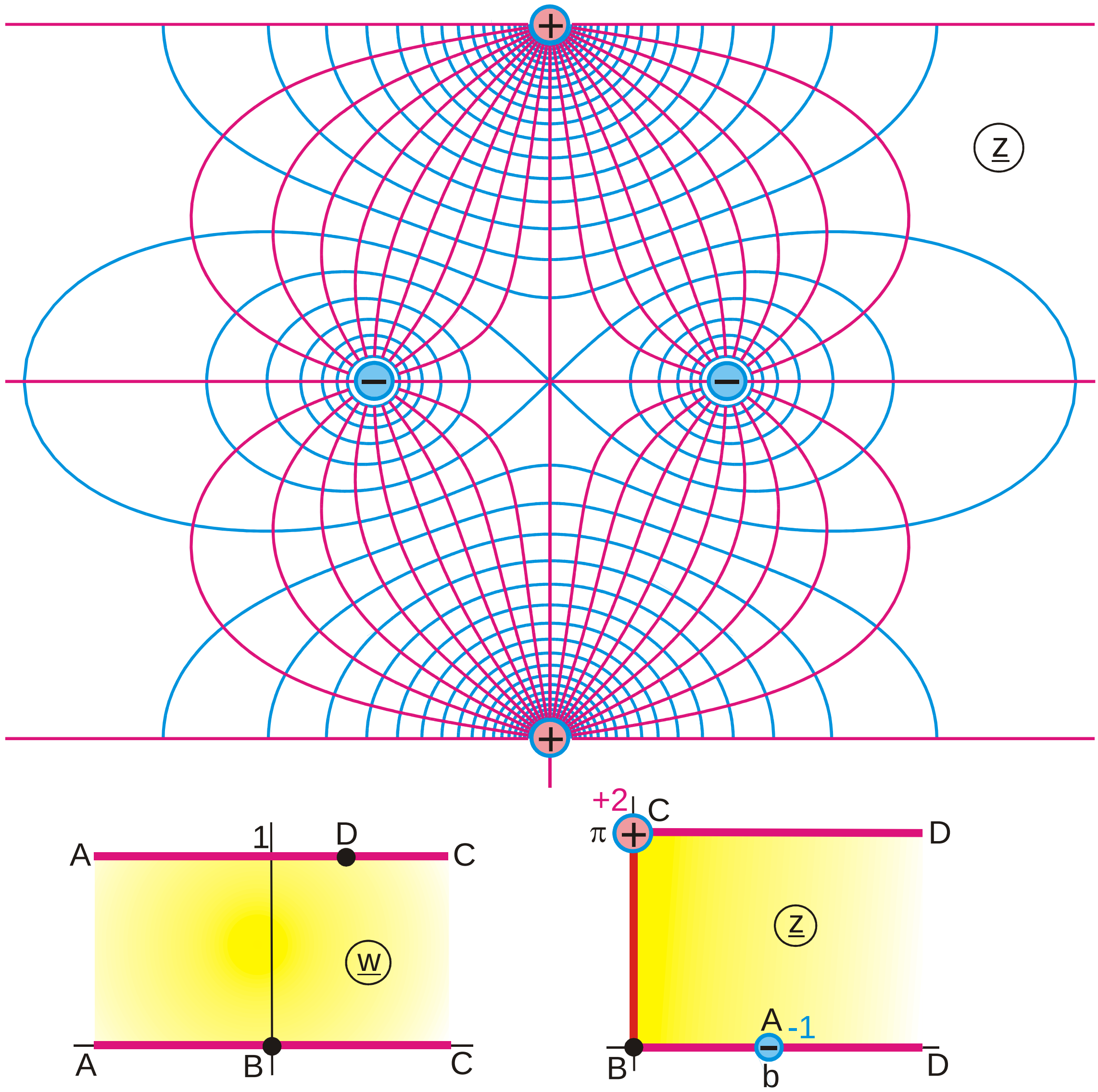


Abbildung H 3.6

$z = \ln w_3$

$w_3 = \dfrac{1 + a w_2}{1 - a w_2}$

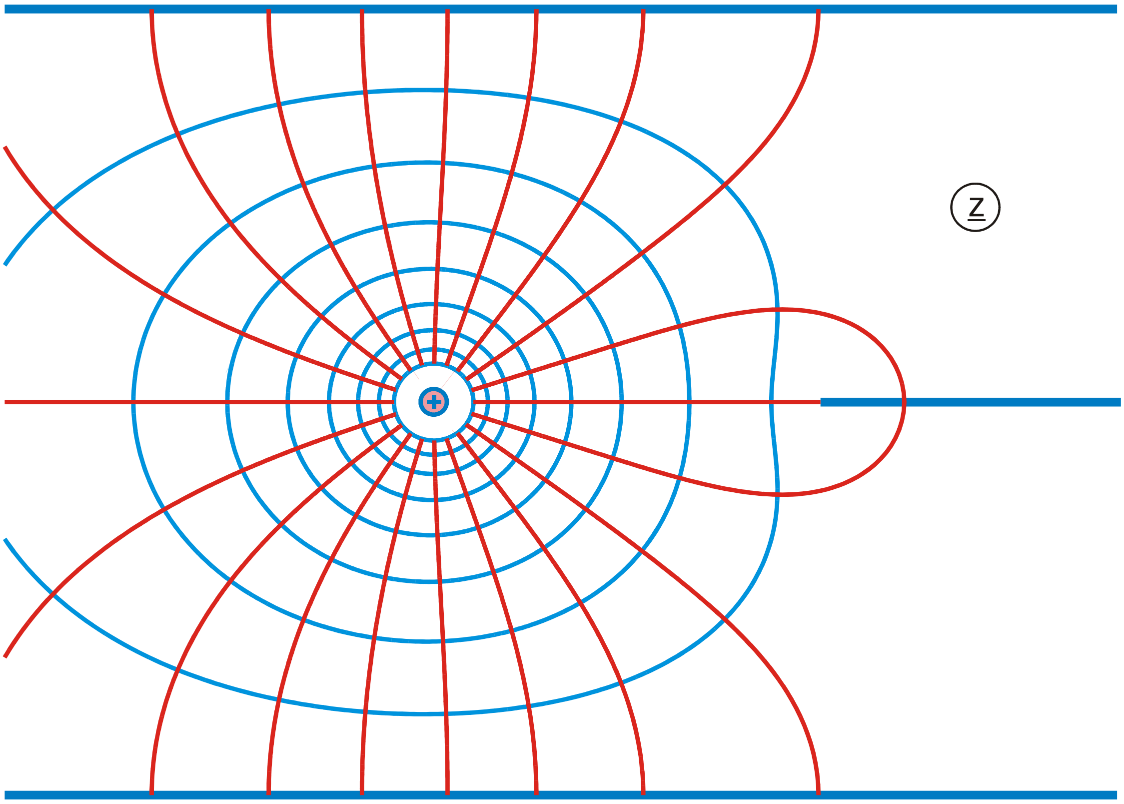
$w_2 = \sqrt{1 + w_1}$

$w_1 = \exp(\pi w)$

$a = \dfrac{\exp(b) - 1}{\exp(b) + 1}$

$-0{,}5 \le u \le 1{,}8$

$0 \le v \le 1$



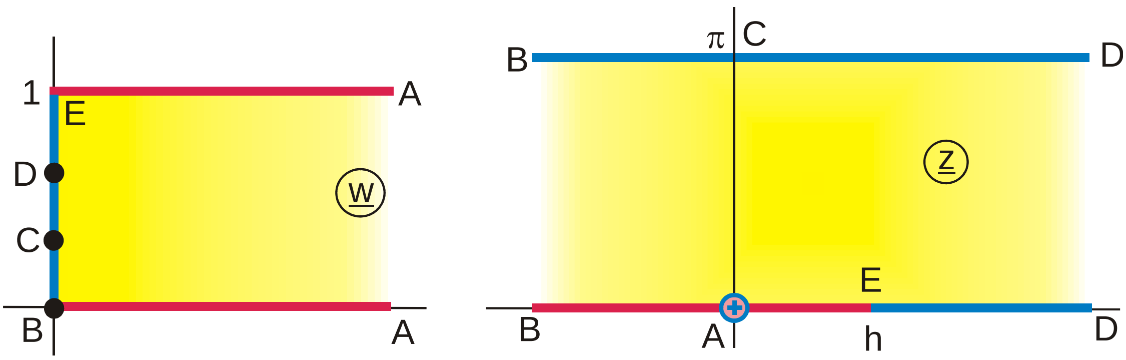


Abbildung H 4

$$z = \ln w_1$$

$$w_1 = 1 - \frac{1+\sigma}{\sigma + \cosh(w\pi)}$$

b = exp(h)-1

σ = (b - 1)/(b + 1)

$$v_C = \frac{1}{\pi}\arccos\frac{1-\sigma}{2}$$

$$v_D = \frac{1}{\pi}\arccos(-\sigma)$$

$0 \leq u \leq 1$

$0 \leq v \leq 1$

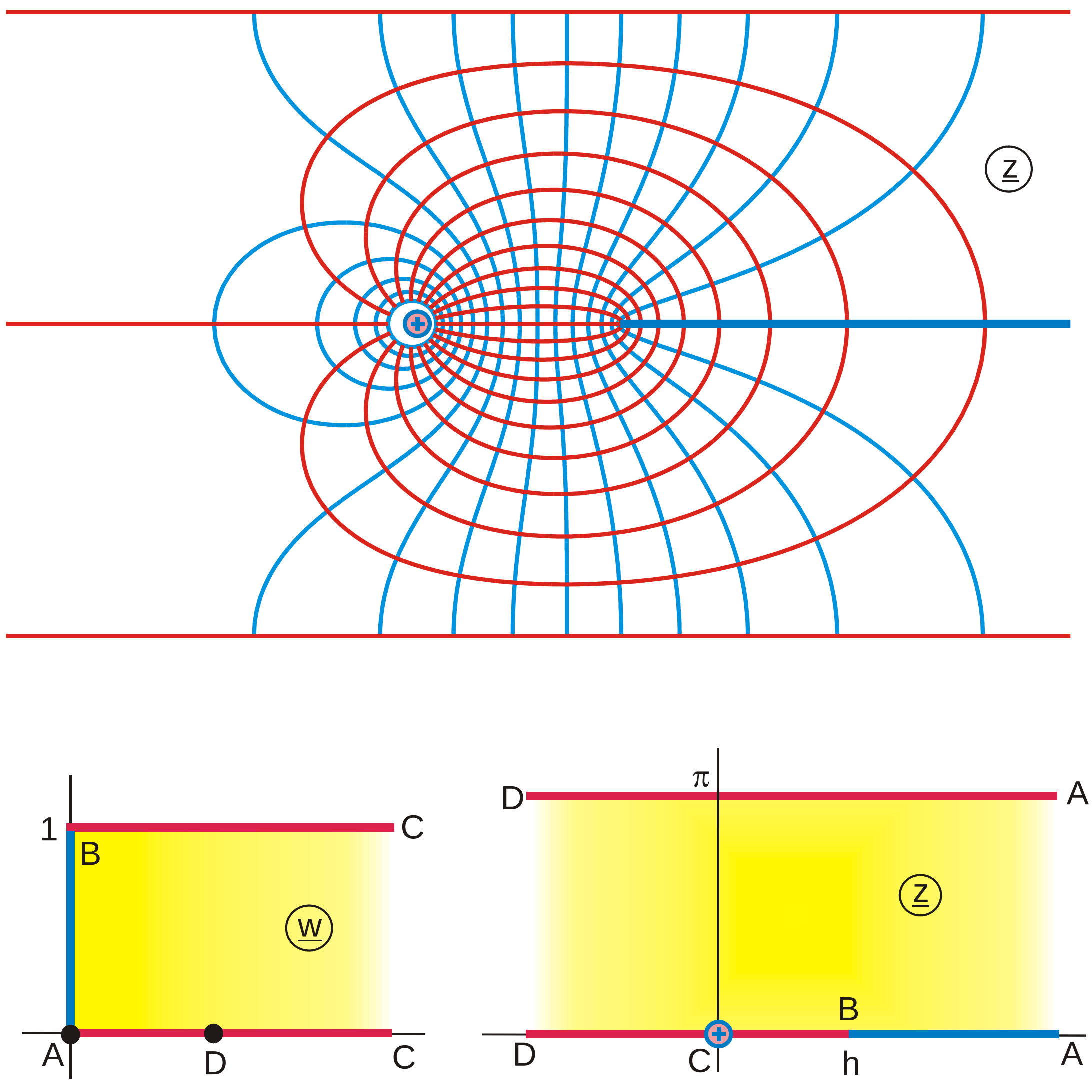


Abbildung H 4.1

$z = \ln w_3$

$w_3 = 1 + a - a w_2^{\,2}$

$w_2 = \dfrac{w_1 + 1}{w_1 - 1}$

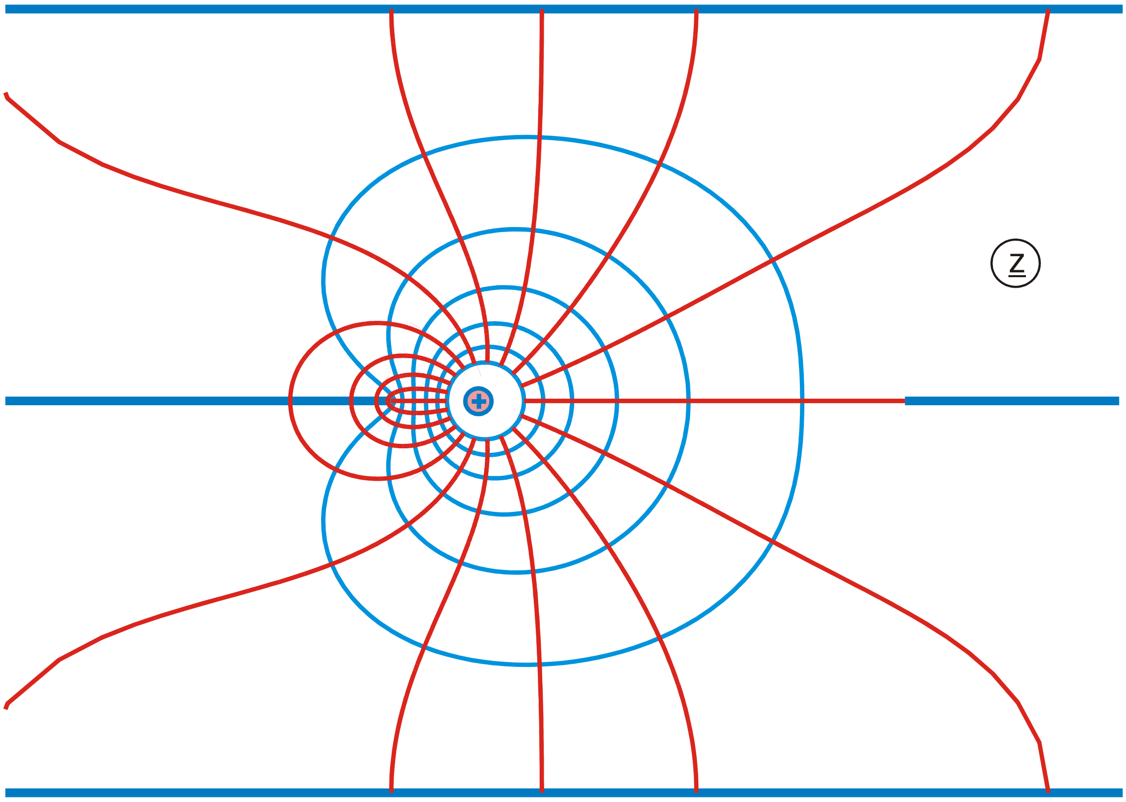
$w_1 = \exp(w\pi)$

$a = \exp(h) - 1$

$u_D = \dfrac{2}{\pi} ar\tanh\sqrt{\dfrac{a}{1+a}}$

$0 \le u \le 1{,}5$

$0 \le v \le 1$



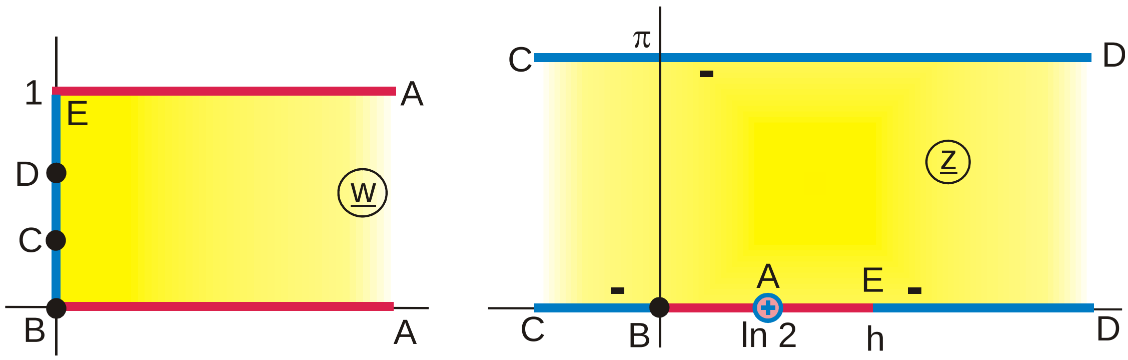


Abbildung H 4.2

$z = \ln w_1$

$w_1 = 2 - \dfrac{1+\sigma}{\sigma + \cosh(w\pi)}$

b = exp(h)-2

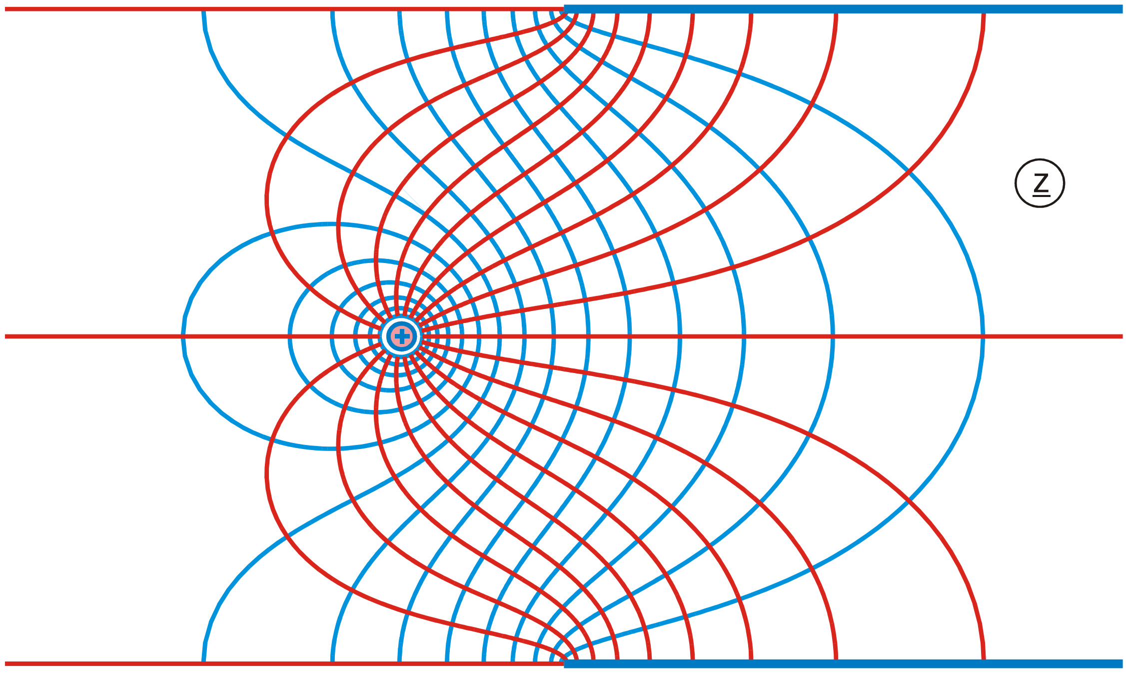
σ = (b - 1)/(b + 1)

$v_C = \dfrac{1}{\pi} \arccos \dfrac{1-\sigma}{2}$

$v_D = \dfrac{1}{\pi} \arccos(-\sigma)$

$0 \leq u \leq 0{,}6$

$0 \leq v \leq 1$



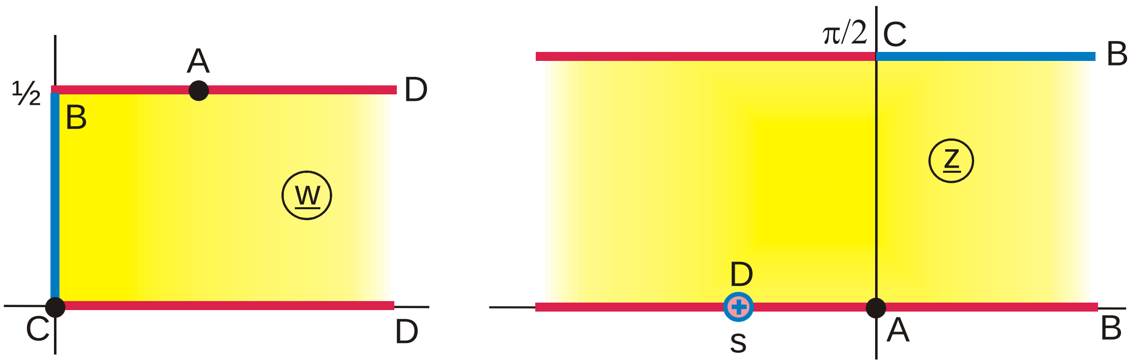


Abbildung H 4.3

$z = \ln w_2 + j\pi$

$w_2 = 1 - w_1 a$ $w_1 = \tanh^2(w\pi)$

$a = \exp(s)+1$

$0 \leq u \leq 0{,}75$ $0 \leq v \leq 0{,}5$

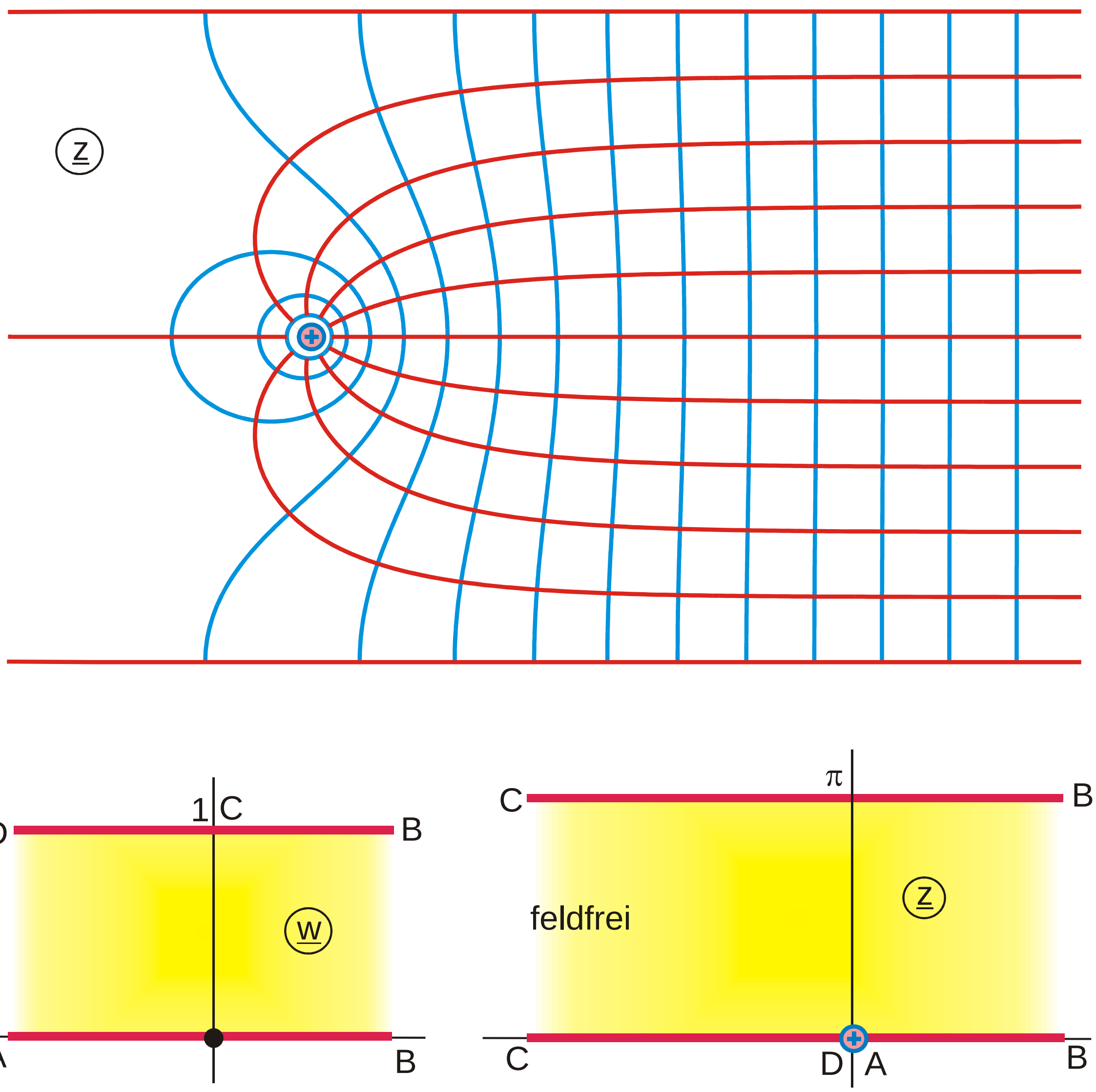


Abbildung H 4.4

$z = \ln(1 + w_1)$

$w_1 = \exp(w\pi)$

$-0{,}5 \leq u \leq 2{,}5$ $0 \leq v \leq 1$

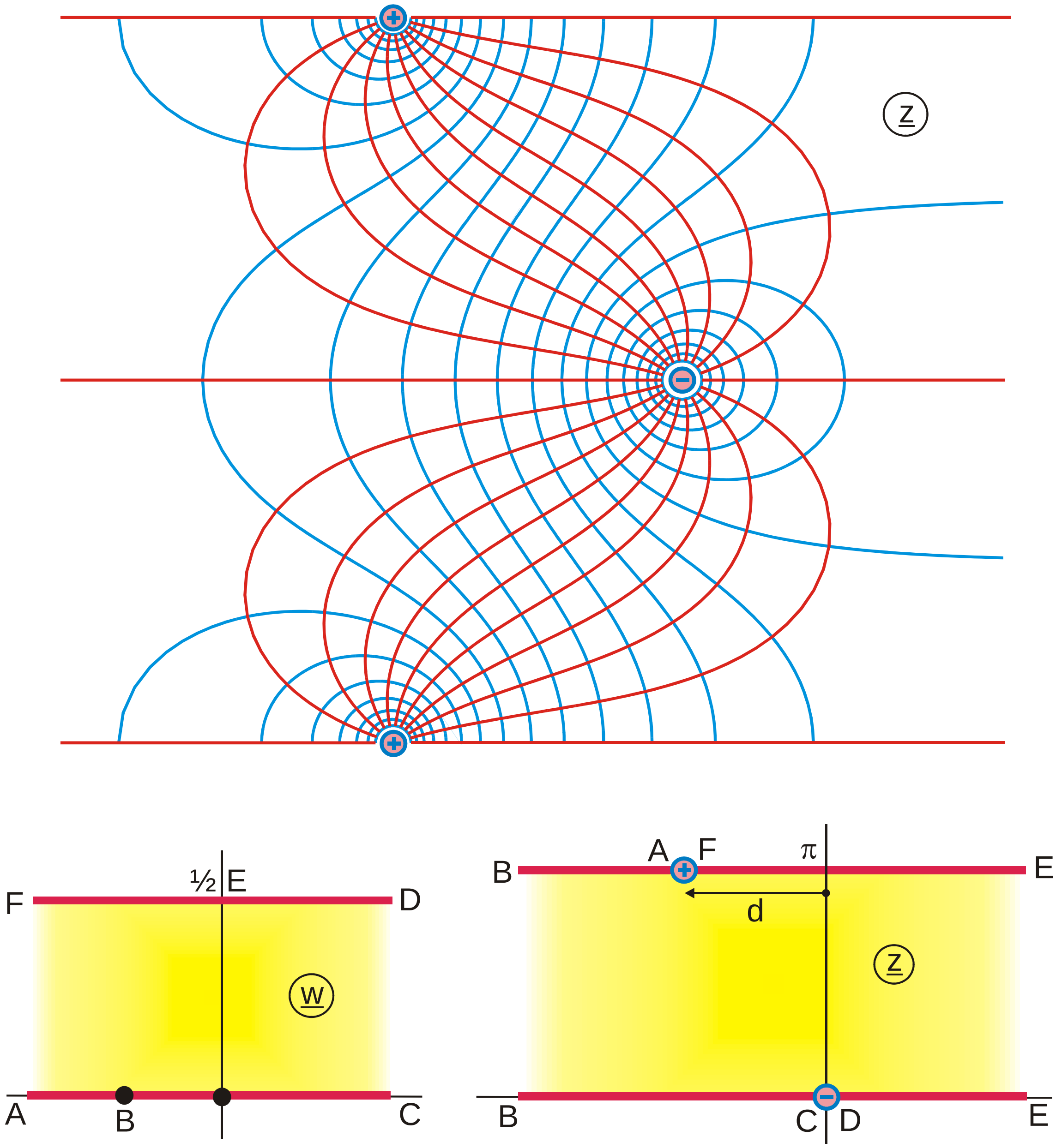


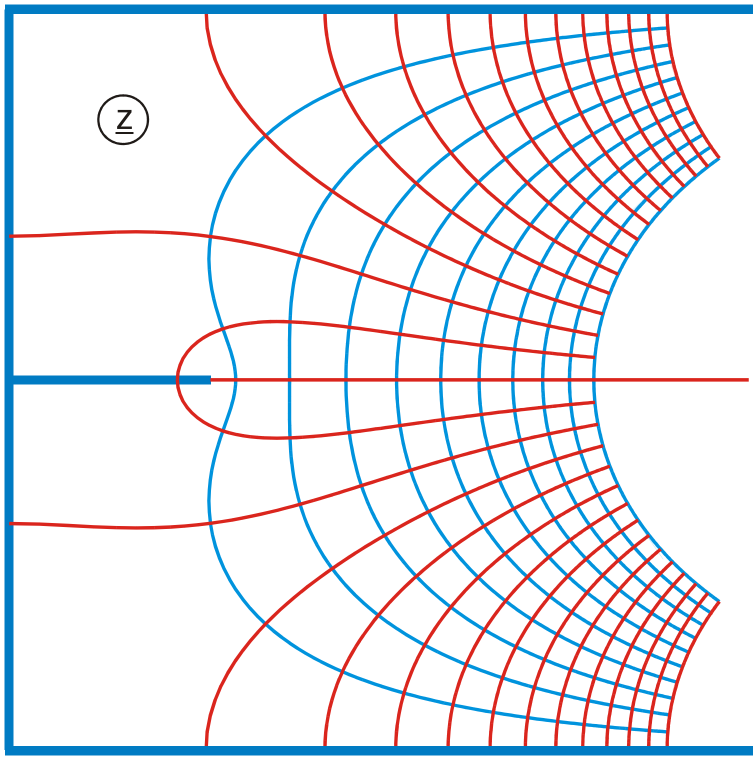
Abbildung H 5

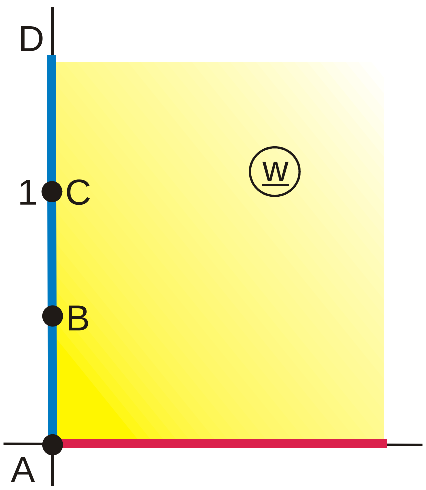
$$z = \ln\left[(1+a)\frac{\tanh(w\pi)-1}{2}+1\right]$$

$$u_B = \frac{1}{\pi} ar\tanh\left(\frac{a-1}{a+1}\right)$$

a = exp(d)

-0,7 ≤ u ≤ 0,3 0 ≤ v ≤ 0,5





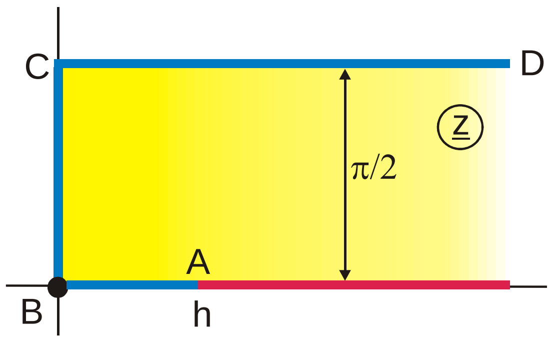


Abbildung H 6

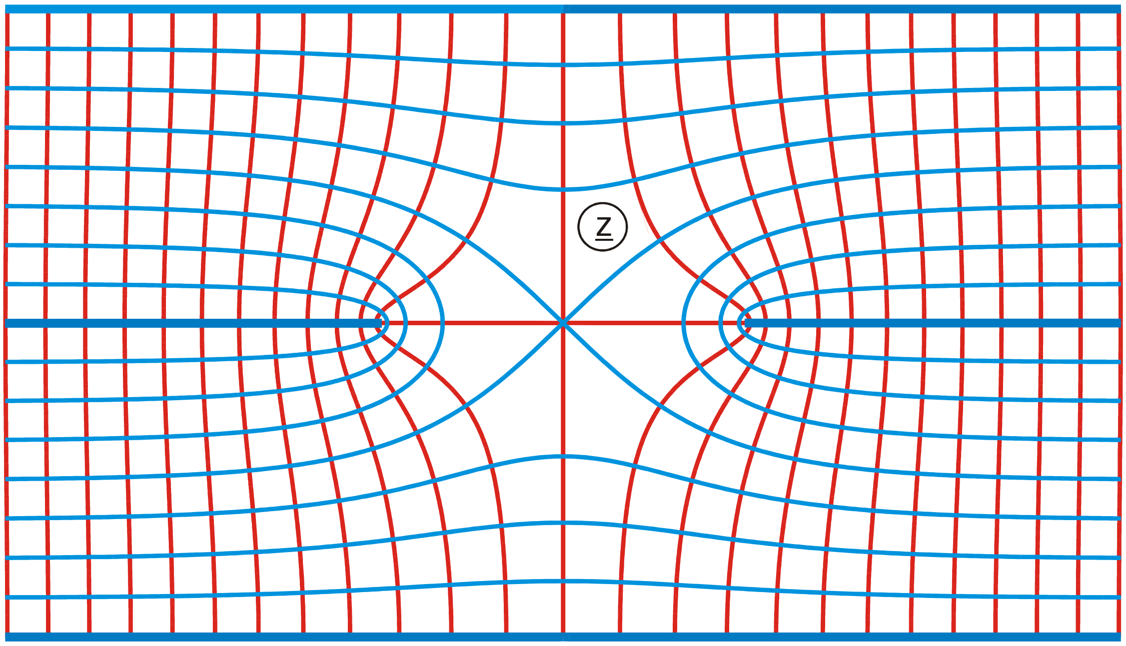
$$z = ar\cosh\left(\sigma\sqrt{w^2+1}\right)$$

$\sigma = \cosh h$

$$v_B = \sqrt{1-\frac{1}{\sigma^2}}$$

$0 \leq u \leq 5$

$0 \leq v \leq 5$



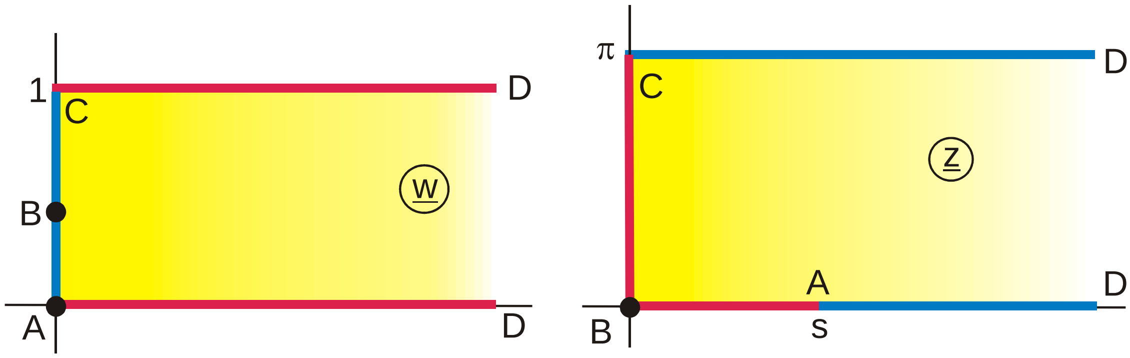


Abbildung H 6.1

$$z = j\left[\frac{\pi}{2} - \arcsin(w_1)\right]$$

$$w_1 = a\left[\cosh(w\pi) + 1\right] - 1$$

$$v_B = \frac{1}{\pi}\arccos\left(\frac{2}{a} - 1\right) \qquad a = \frac{1}{2}\left[1 + \cosh s\right]$$

$0 \le u \le 2$ $\qquad$ $0 \le v \le 1$

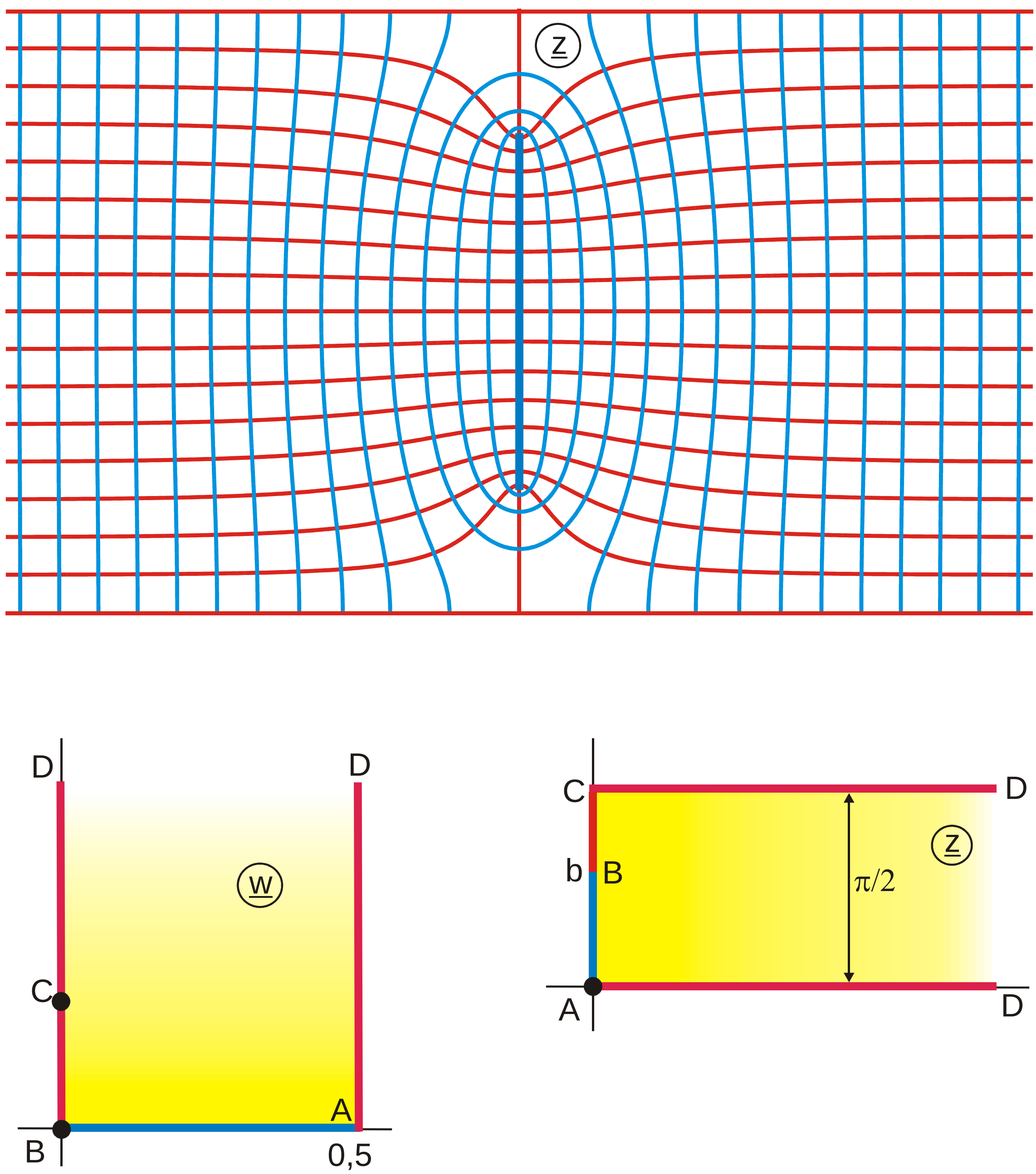


Abbildung H 6.2

$z = ar\sinh\left[j\sigma \cos(w\pi) \right]$

σ = sin b

$v_C = \frac{1}{\pi} ar\cosh\frac{1}{\sigma}$

b = π/2 für σ = 1

0 ≤ u ≤ 0,5

0 ≤ v ≤ 1

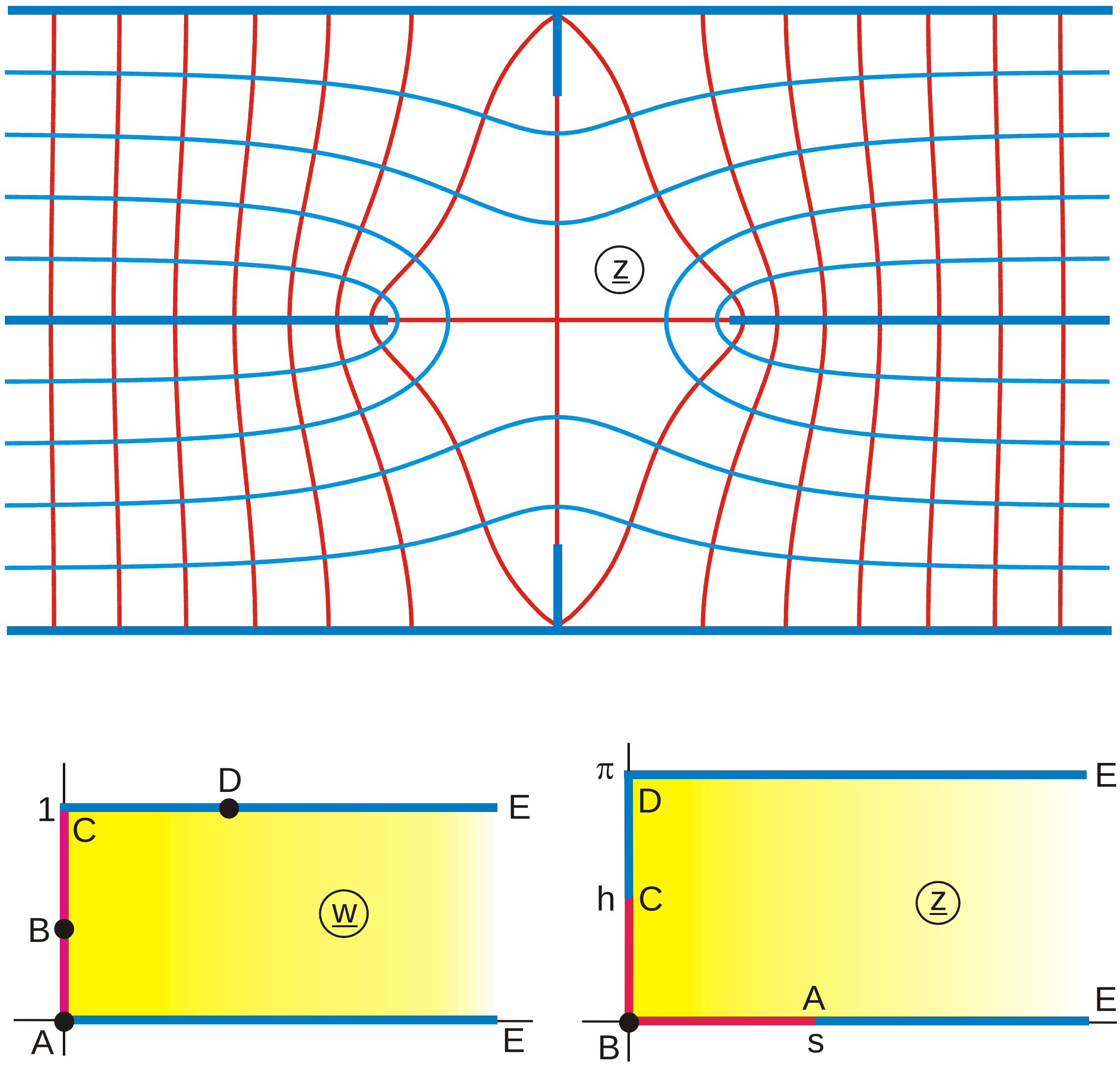


Abbildung H 6.3

$$z = j\left[\frac{\pi}{2} - \arcsin(w_1)\right]$$

$$w_1 = a\left[\cosh(w\pi) + 1\right] - b$$

$$b = \sin(h - \pi/2)$$

$$s = \operatorname{arcosh}(2a - b)$$

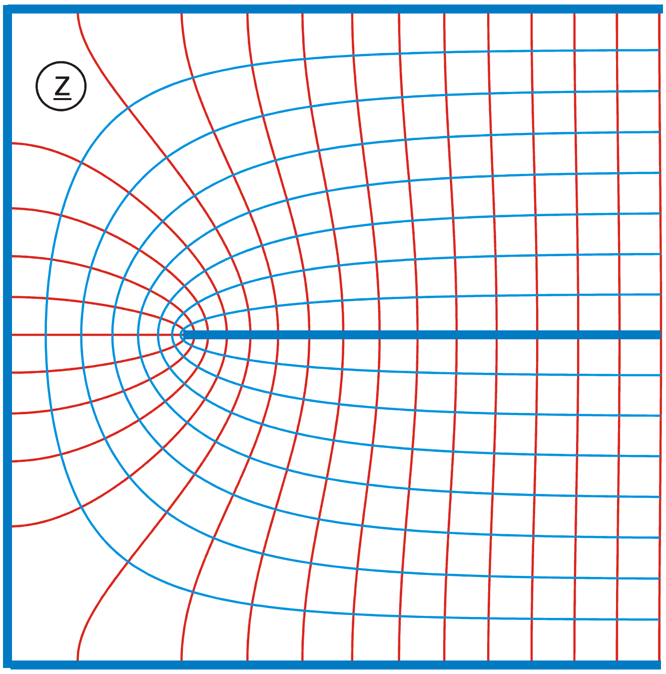
$$a = \frac{1}{2}\left[b + \cosh s\right]$$

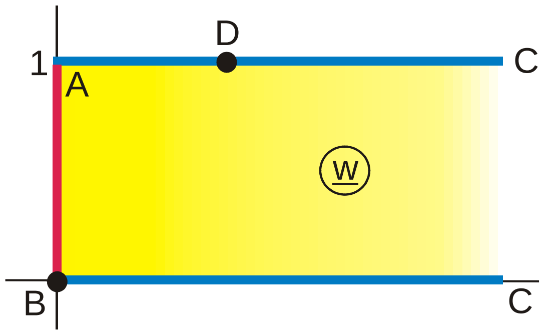
$$v_B = \frac{1}{\pi}\arccos\left(\frac{1+b}{a} - 1\right)$$

$$u_C = \frac{1}{\pi}\operatorname{ar\,cosh}\left(\frac{1-b}{a} + 1\right)$$

$0 \le u \le 2$

$0 \le v \le 1$





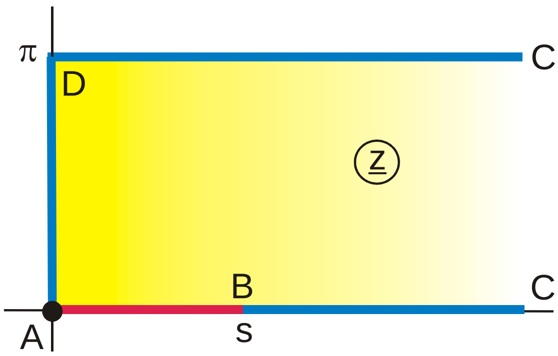


Abbildung H 6.4

$$z = j\left[\frac{\pi}{2} - \arcsin(w_1)\right] = \operatorname{ar}\cosh w_1$$

$$w_1 = \frac{a}{2}\left[\cosh(w\pi) + 1\right] + 1$$

$s = \operatorname{arcosh}(1 + a)$ $\qquad$ $a = -1 + \cosh s$

$$u_D = \frac{1}{\pi}\operatorname{ar}\cosh\left(\frac{4}{a} + 1\right)$$

$0 \le u \le 2$ $\qquad$ $0 \le v \le 1$

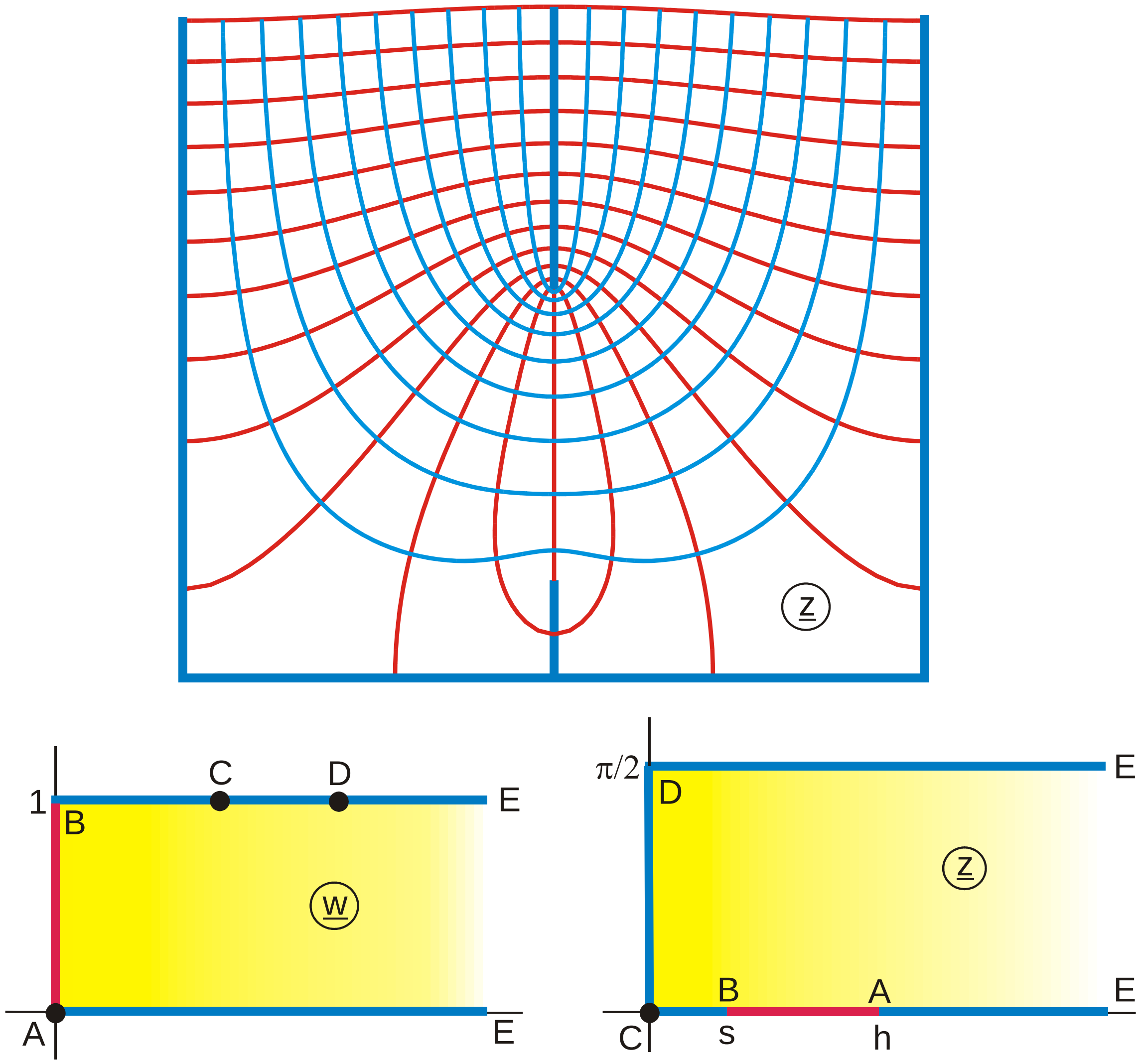


Abbildung H 6.5

$$z = j\left[\frac{\pi}{2} - \arcsin(w_1)\right]$$

$$w_1 = \frac{a}{2}\left[\cosh(w\pi) + 1\right] + b$$

$b = \cosh s$

$$u_D = \frac{1}{\pi}\operatorname{ar\,cosh}\left(\frac{2(1+b)}{a} + 1\right)$$

$0 \le u \le 1{,}2$

$a = -b + \cosh h$

$$u_C = \frac{1}{\pi}\operatorname{ar\,cosh}\left(\frac{2(1-b)}{a} - 1\right)$$

$0 \le v \le 1$

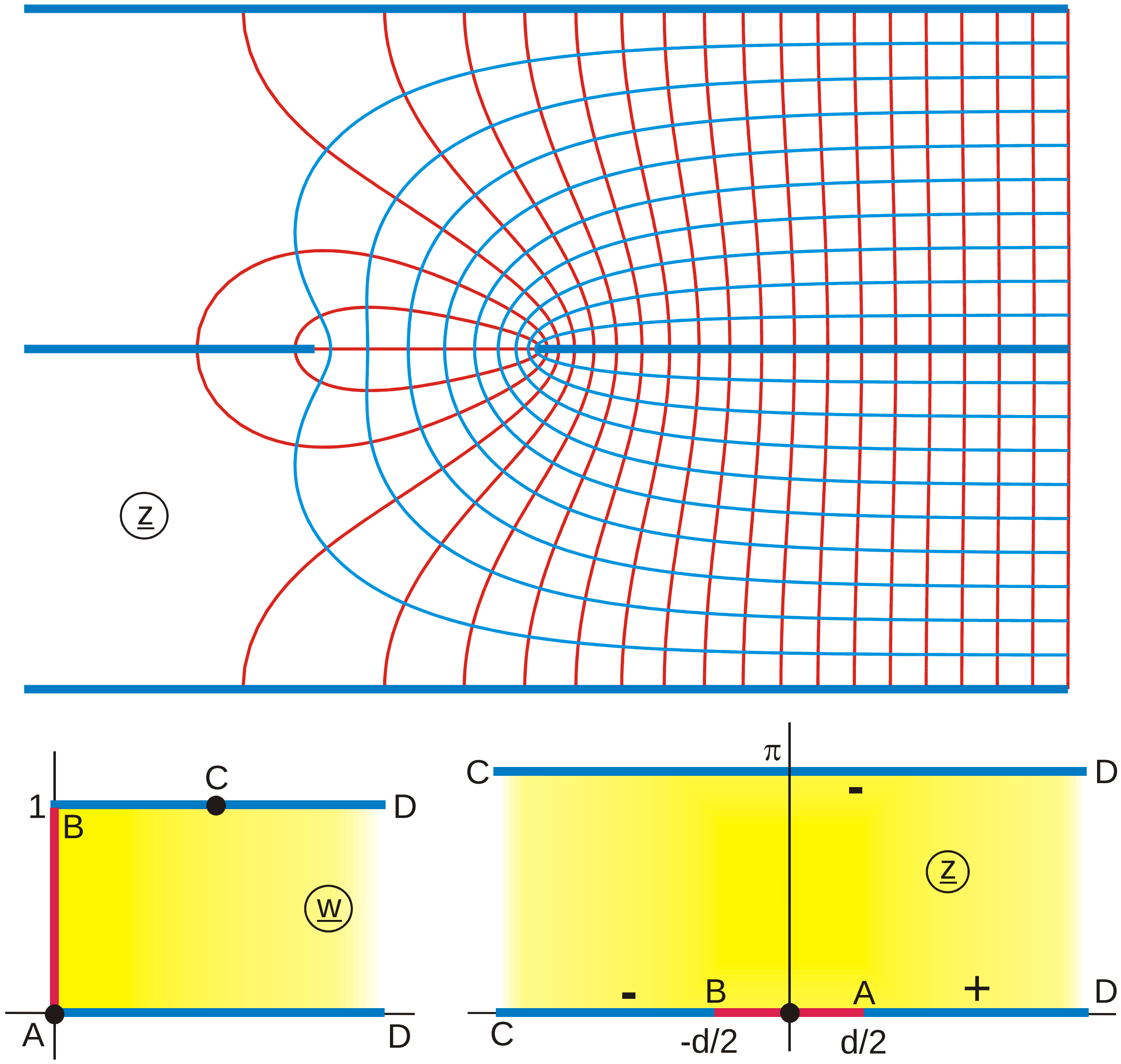


Abbildung H 6.6

$$z = \ln w_1 + \frac{d}{2}$$

$$w_1 = 1 + \frac{b}{2}\left[\cosh(w\pi) - 1\right]$$

b = 1 - exp(-d)

$$u_C = \frac{1}{\pi} \operatorname{ar\,cosh}\left(\frac{2}{b} - 1\right)$$

$0 \le u \le 2$ $\quad$ $0 \le v \le 1$

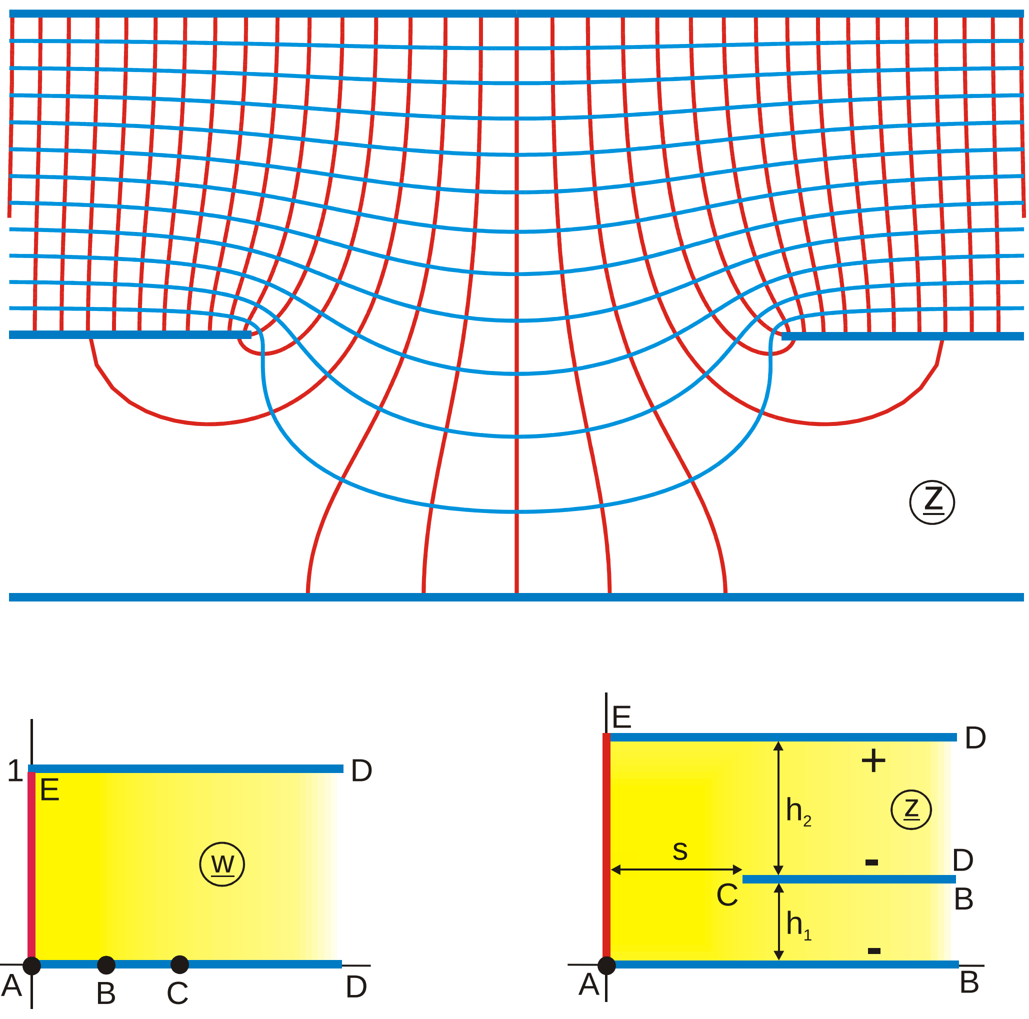


Abbildung H 6.7

$$z = 2\,\mathrm{ar\,coth}\frac{w_1}{a} + 2b\,\mathrm{ar\,coth}(w_1 a)$$

$$w_1 = \frac{a}{\tanh(w_0\pi/2)}$$

$$w_0 = \exp(w\pi)$$

$$h_1 = \pi b$$

$$h_2 = \pi$$

$$u_B = \frac{2}{\pi}\mathrm{ar\,tanh}(a^2)$$

$$u_C = \frac{2}{\pi}\mathrm{ar\,tanh}\left(\frac{a}{p}\right)$$

$$p = \sqrt{\frac{1 + a^2 b}{a^2 + b}}$$

$$0 \le a \le 1$$

$$s = 2\,\mathrm{artanh}(a/p) + 2b\,\mathrm{artanh}(ap)$$

$$0 \le u \le 1{,}5$$

$$0 \le v \le 1$$

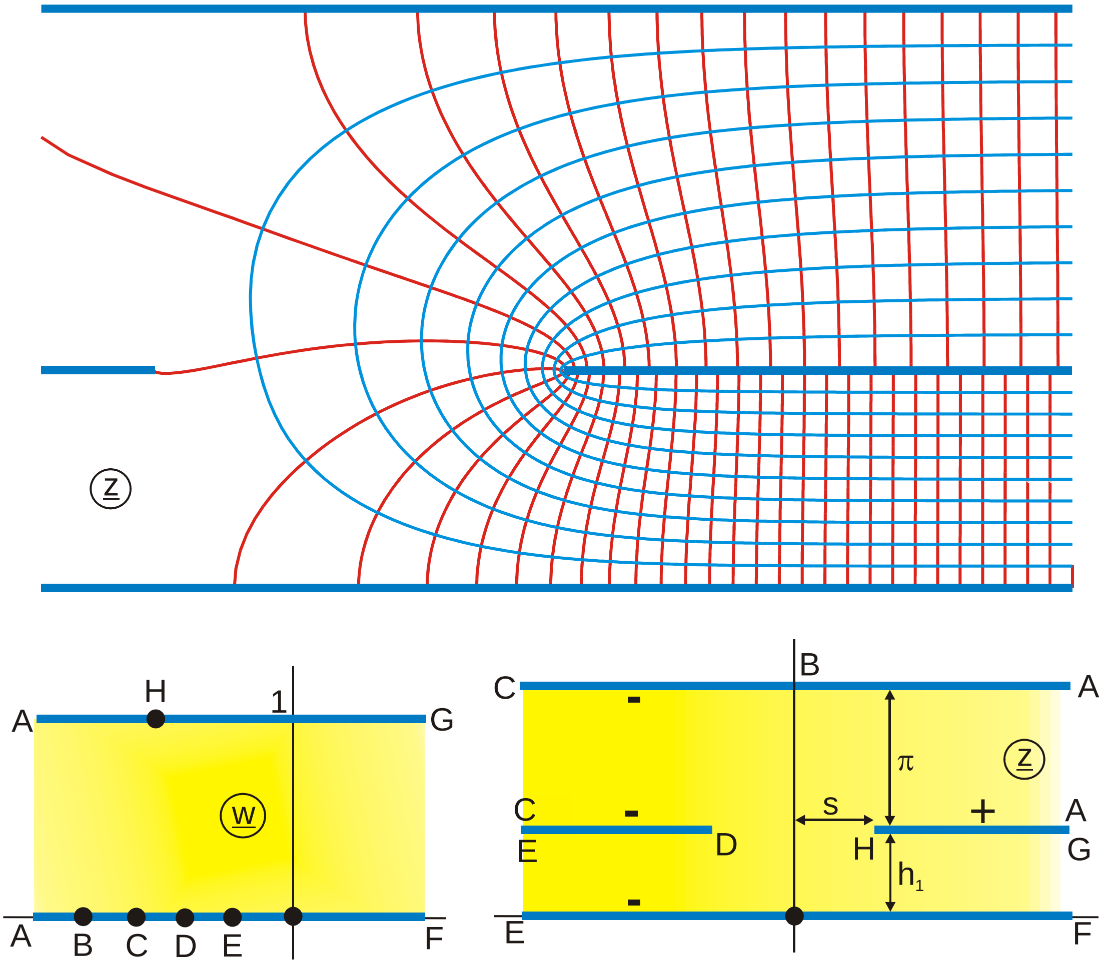


Abbildung H 6.8

$$z = 2\,\mathrm{ar\,coth}\frac{w_1}{a} + 2b\,\mathrm{ar\,coth}(w_1 a)$$

$$w_1 = \frac{w_0/a - a}{w_0 - 1} \qquad w_0 = \exp(w\pi)$$

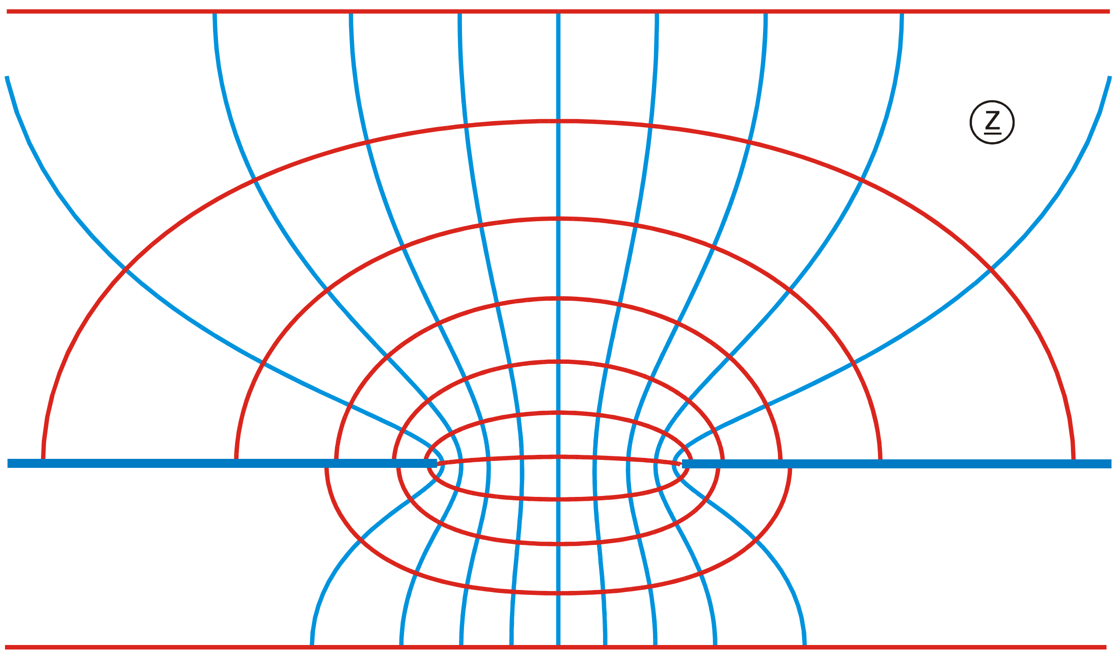
$$u_B = \frac{2}{\pi}\ln a \qquad u_C = -\frac{1}{\pi}\ln\frac{1+1/a^2}{2}$$

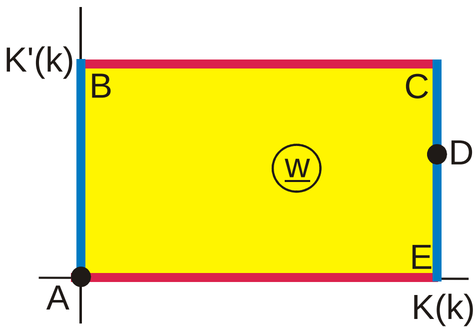
$$u_D = \frac{1}{\pi}\ln\frac{p+a}{p+1/a} \qquad u_E = \frac{1}{\pi}\ln\frac{1+a^2}{2}$$

$$p = \sqrt{\frac{1+a^2 b}{a^2+b}} \qquad 0 \le a \le 1$$

$s = 2\,\mathrm{artanh}(a/p) + 2b\,\mathrm{artanh}(ap)$ $\qquad h_1 = \pi b$

$-2 \le u \le 3$ $\qquad 0 \le v \le 1$





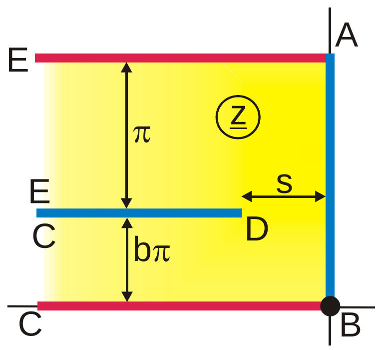


Abbildung H 6.9

$$z = -2\,\mathrm{ar\,tanh}\frac{1}{w_1} - 2b\,\mathrm{ar\,tanh}\frac{1}{w_1 a^2}$$

$$w_1 = \mathrm{sn}(w,k)$$

$$v_D = \mathrm{Im}\,F_a\left(\frac{p}{a},k\right) \qquad k = a^2$$

$$p = \sqrt{\frac{1+a^2 b}{a^2+b}}$$

s = 2 artanh(a/p) + 2b artanh(ap)

$0 \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

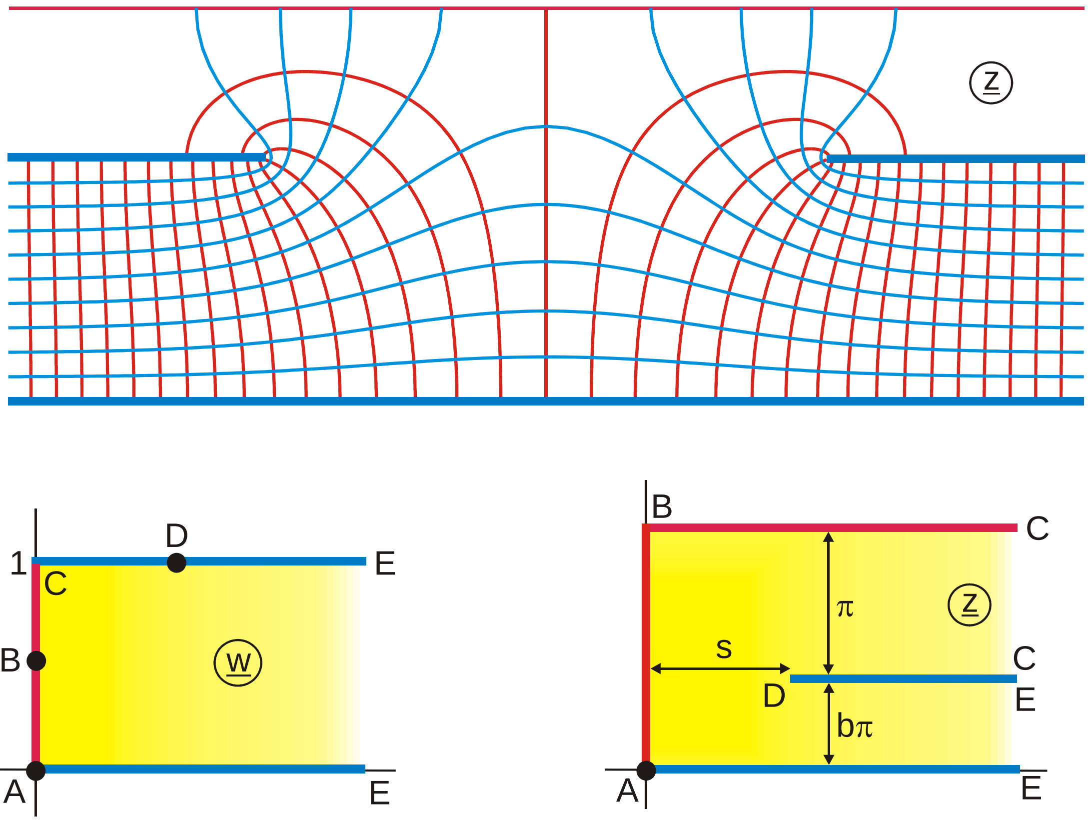


Abbildung H 6.10

$$z = 2\,\text{ar}\coth\frac{w_2}{a} + 2b\,\text{ar}\coth(w_2 a)$$

$$w_2 = \frac{1}{a}\sqrt{\frac{w_1^{\,2} - a^4}{w_1^{\,2} - 1}}$$

$$w_1 = \cosh(w\pi)$$

$$v_B = \frac{1}{\pi}\arccos a^2$$

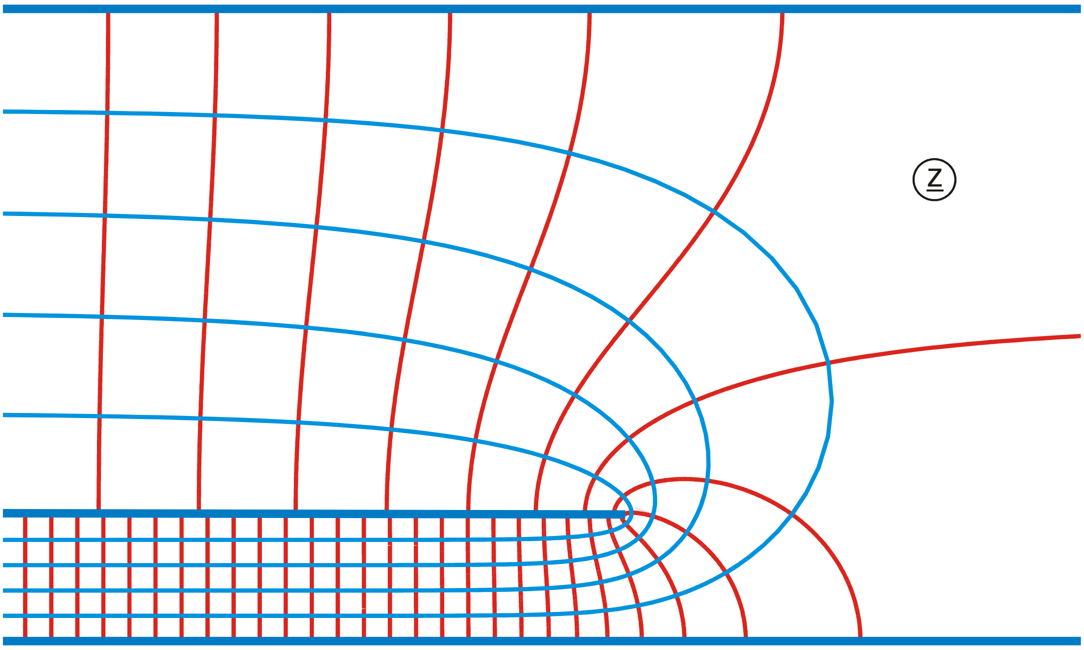
$$u_D = \frac{1}{\pi}\,\text{ar}\sinh\sqrt{\frac{p^2a^2 - a^4}{1 - p^2a^2}}$$

$$p = \sqrt{\frac{1 + a^2 b}{a^2 + b}}$$

$s = 2\,\text{artanh}(a/p) + 2b\,\text{artanh}(ap)$

$0 \le u \le 1$

$0 \le v \le 0{,}5$



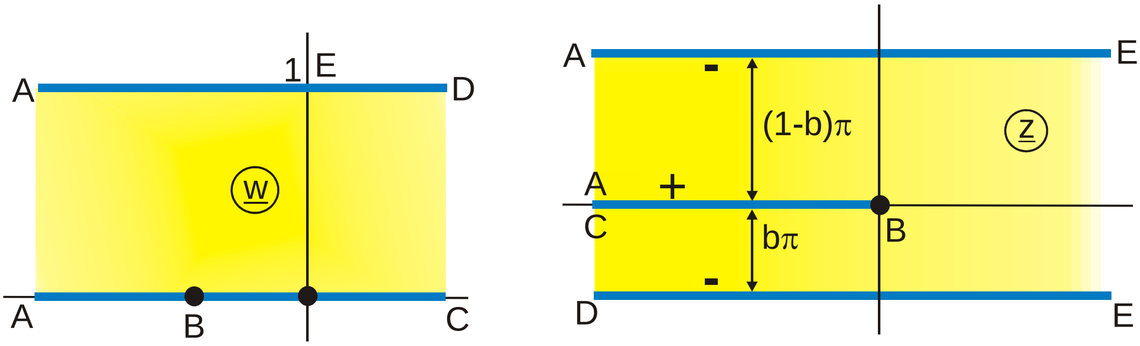


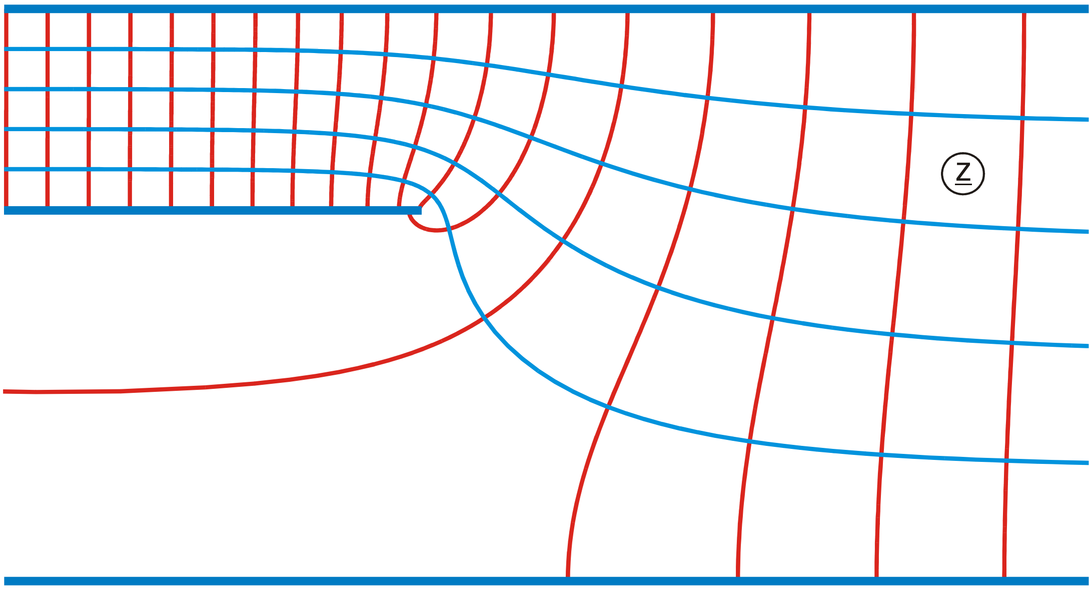
Abbildung H 6.11

$$z = c - b\pi w - \ln\{1 + \exp(-w\pi)\}$$

$$c = (b-1)\ln\left(\frac{1}{b} - 1\right) - \ln b$$

$$u_B = \frac{1}{\pi}\ln\left(\frac{1}{b} - 1\right)$$

$-2 \leq u \leq 8$ $0 \leq v \leq 1$



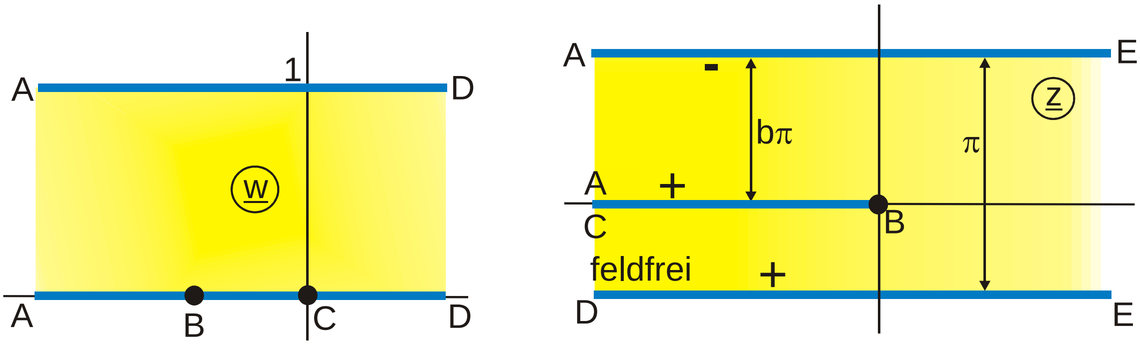


Abbildung H 6.12

$$z = \frac{w\pi + (1-a)\ln\{\exp(w\pi) - 1\} + s - j\pi(1-a)}{2-a}$$

$$s = (2-a)\ln(2-a) - (1-a)\ln(1-a)$$

$$u_B = -\frac{1}{\pi}\ln(2-a) \qquad a = 2 - 1/b$$

$$-3 \le u \le 2 \qquad 0 \le v \le 1$$

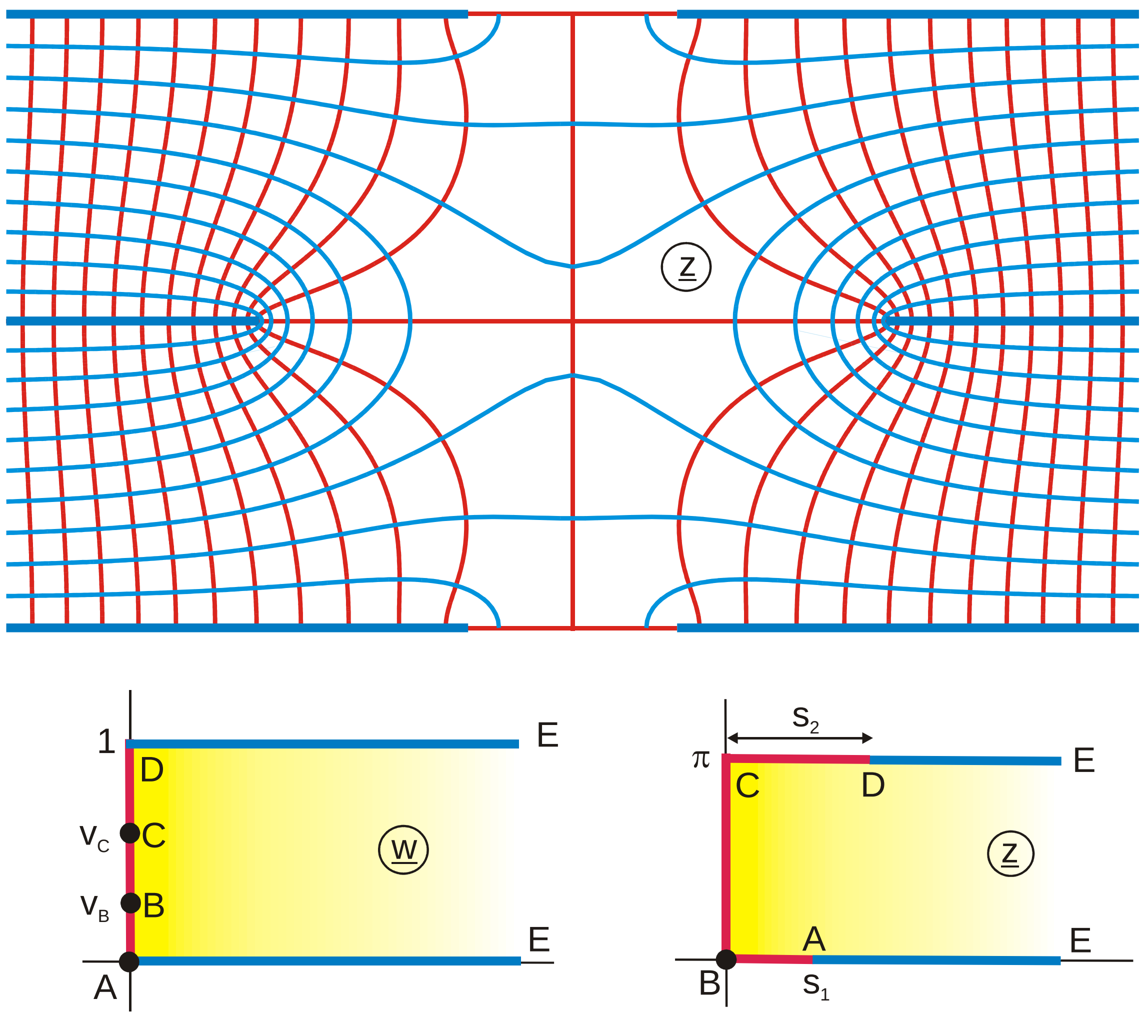


Abbildung H 6.13

$$z = j\left[\frac{\pi}{2} - \arcsin(w_1)\right]$$

$$w_1 = \frac{a}{2}\cosh(w\pi) + b$$

$0 \le u \le 1{,}2$

$0 \le v \le 1$

$$a = \cosh(s_1) + \cosh(s_2)$$

$$b = \left[\cosh(s_1) - \cosh(s_2)\right]/2$$

$$v_B = \frac{1}{\pi}\arccos\left[\frac{2}{a}(1-b)\right]$$

$$v_C = \frac{1}{\pi}\arccos\left[-\frac{2}{a}(1+b)\right]$$

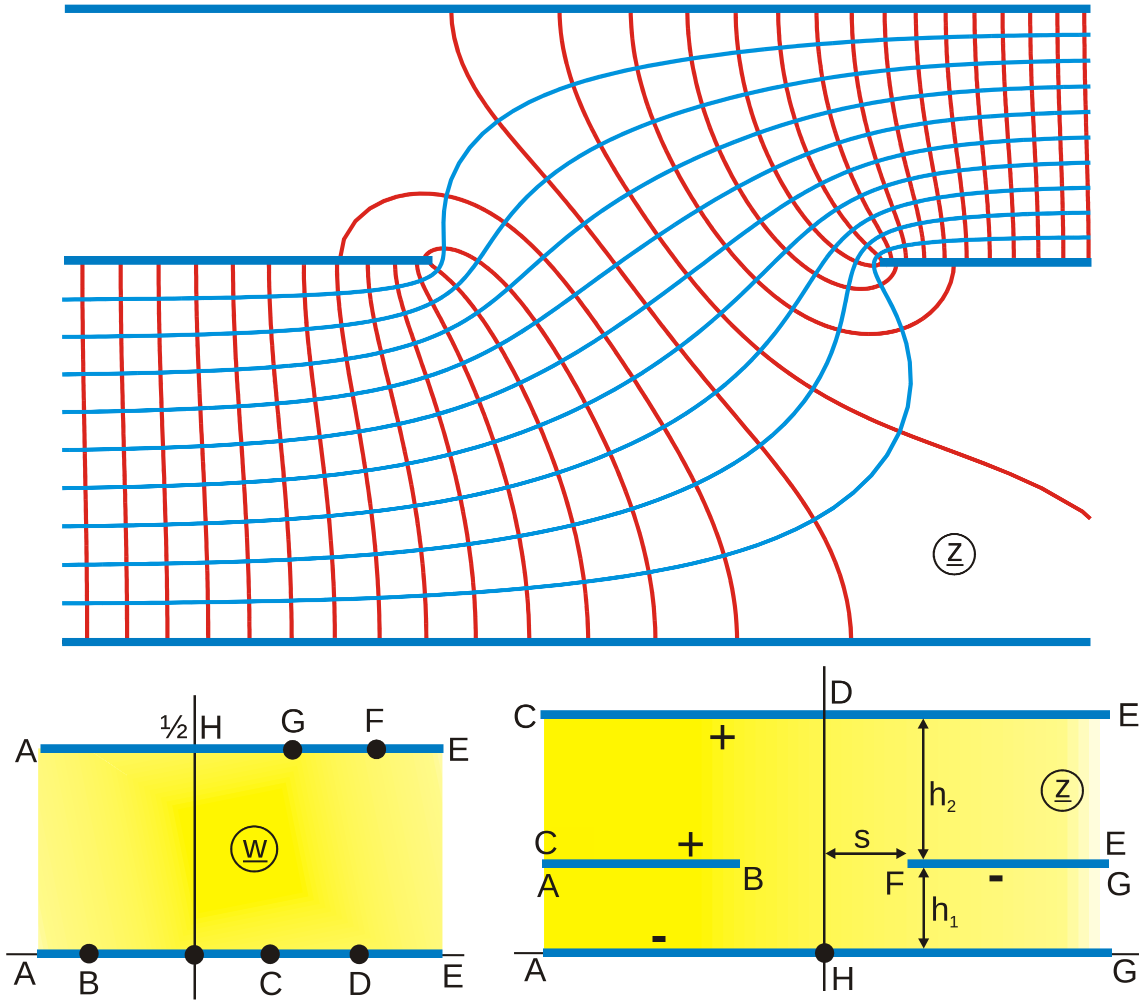


Abbildung H 6.14

$$z = \ln\frac{w_2 + a}{w_2 - a} + b\ln\frac{w_2 + 1/a}{w_2 - 1/a}$$

$$w_2 = \frac{(w_1 + 1)(a + 1/a)}{2} - \frac{1}{a}$$

$w_1 = \tanh(w\pi)$

gegeben: a, b

$h_1 = \pi b$

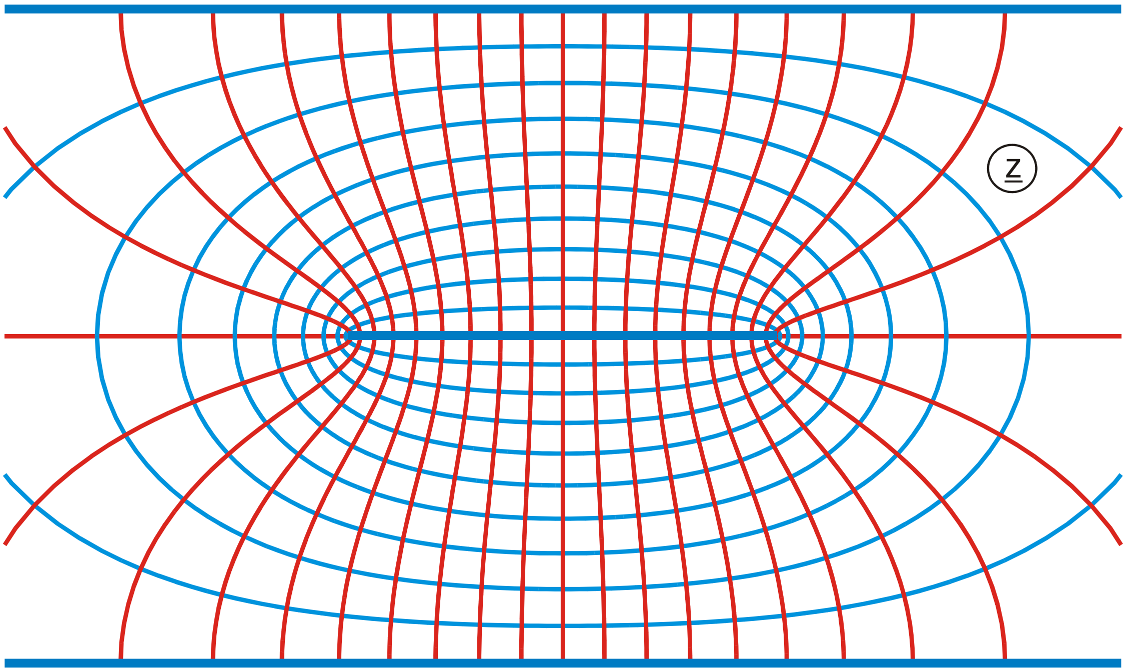
$h_2 = \pi$

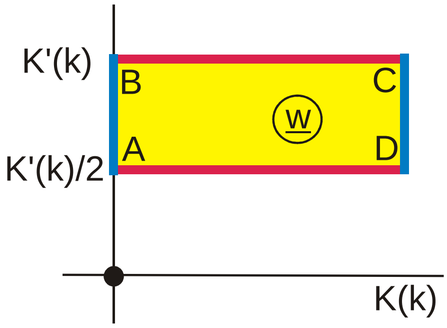
$$p = \sqrt{\frac{1 + a^2 b}{a^2 + b}}$$

$$u_D = \frac{1}{\pi} ar\tanh\frac{1 - a^2}{1 + a^2}$$

$-0{,}7 \le u \le 1{,}3$

$0 \le v \le 0{,}5$





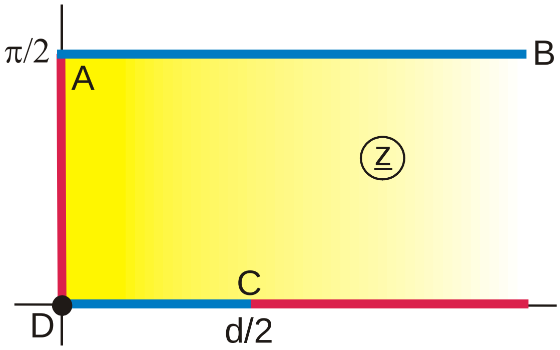


Abbildung H 7

z = ln sn (w,k) – d/2

k = exp(-d)

$0 \leq u \leq K(k)$ $K'(k)/2 \leq v \leq K'(k)$

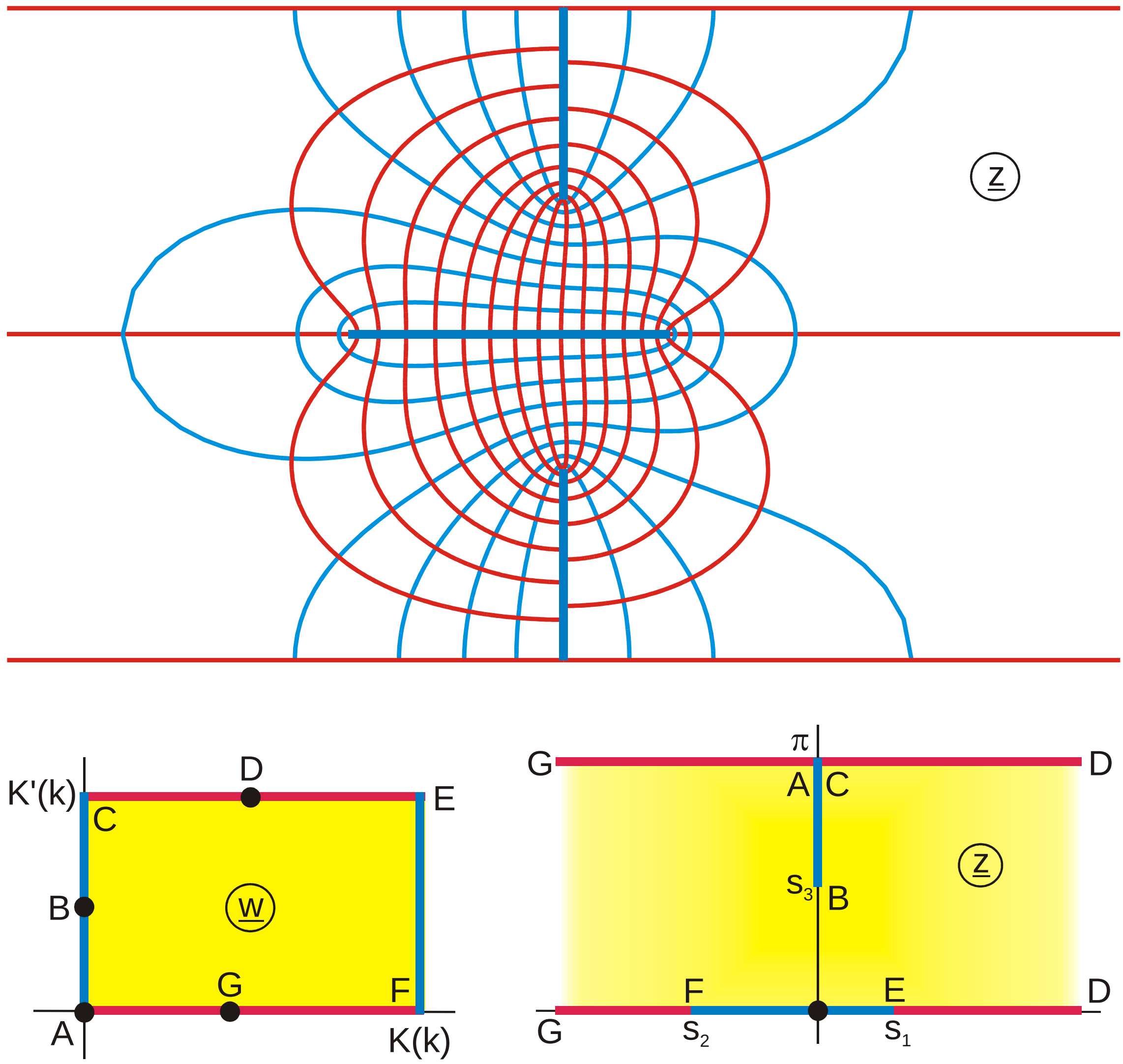


Abbildung H 7.1

$z = \ln w_3$

$$w_3 = \frac{w_2 + j}{w_2 - j}$$

$$w_2 = -2b\frac{w_1}{1 + w_1^2}$$

$w_1 = ja\ \mathrm{sn}(w,k)$

gegeben: s_1, s_2, s_3

$b = 1/\tan(s_3/2)$

$h = 1/\tan(s_2/2)$

$c = h - 1/\tan(s_1/2)$

$$a = \frac{b}{h} + \sqrt{1 + \left(\frac{b}{h}\right)^2}$$

$$v_B = \mathrm{Im}\, F_a\left(\frac{j}{a}, k\right)$$

$$d = \frac{ab\left(a^2 - 1\right)}{2ab - c\left(a^2 - 1\right)}$$

$$k = \sqrt{a^2 + d^2} - d$$

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

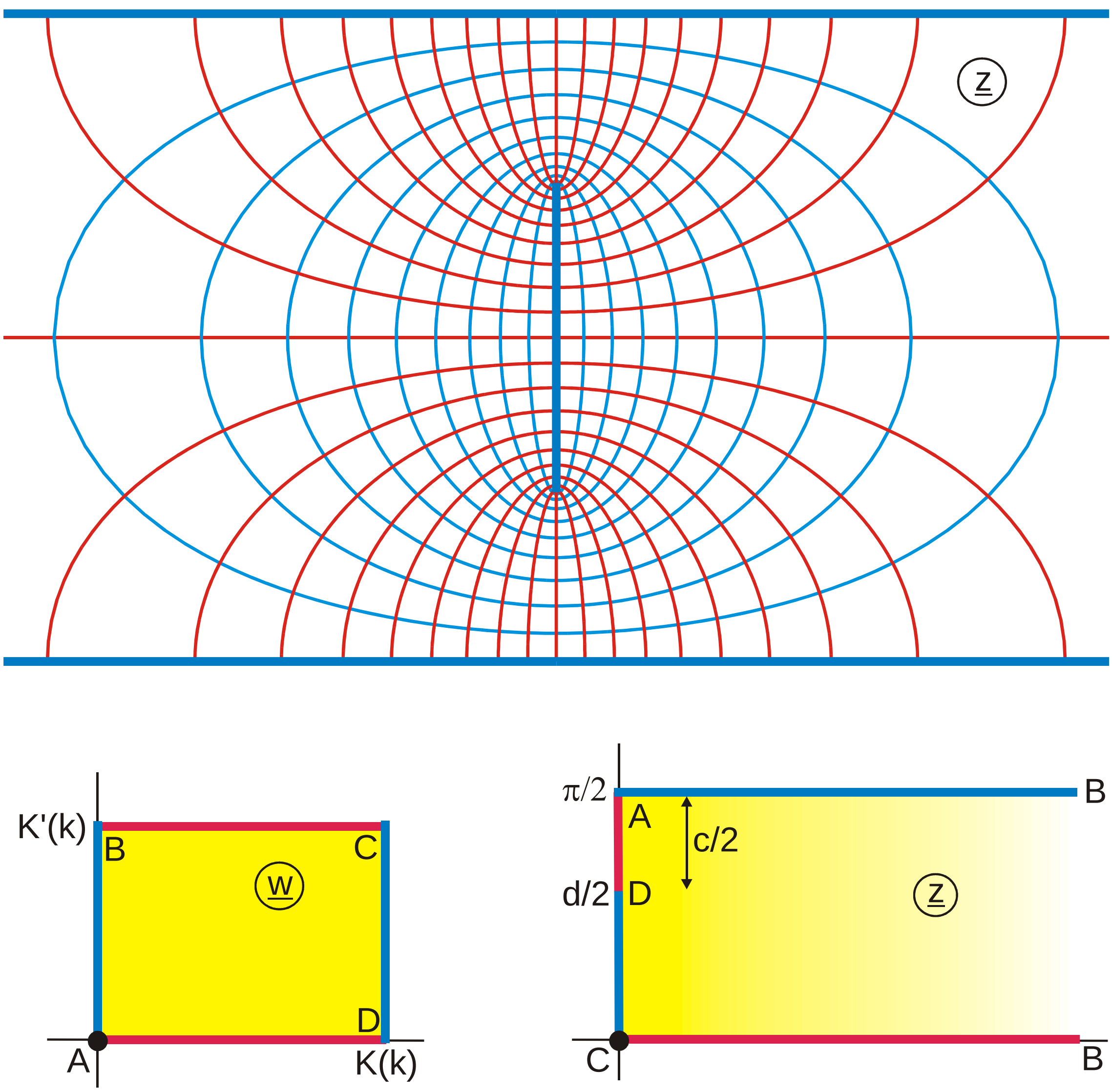


Abbildung H 7.2

$$z = j\left\{\frac{\pi}{2} - \arcsin\left[k\,\mathrm{sn}(w,k)\right]\right\}$$

$$\mathrm{k} = \sin\left(\frac{\pi}{2} - \frac{\mathrm{d}}{2}\right)$$

$0 \le \mathrm{u} \le \mathrm{K(k)}$ $\quad$ $0 \le \mathrm{v} \le \mathrm{K'(k)}$

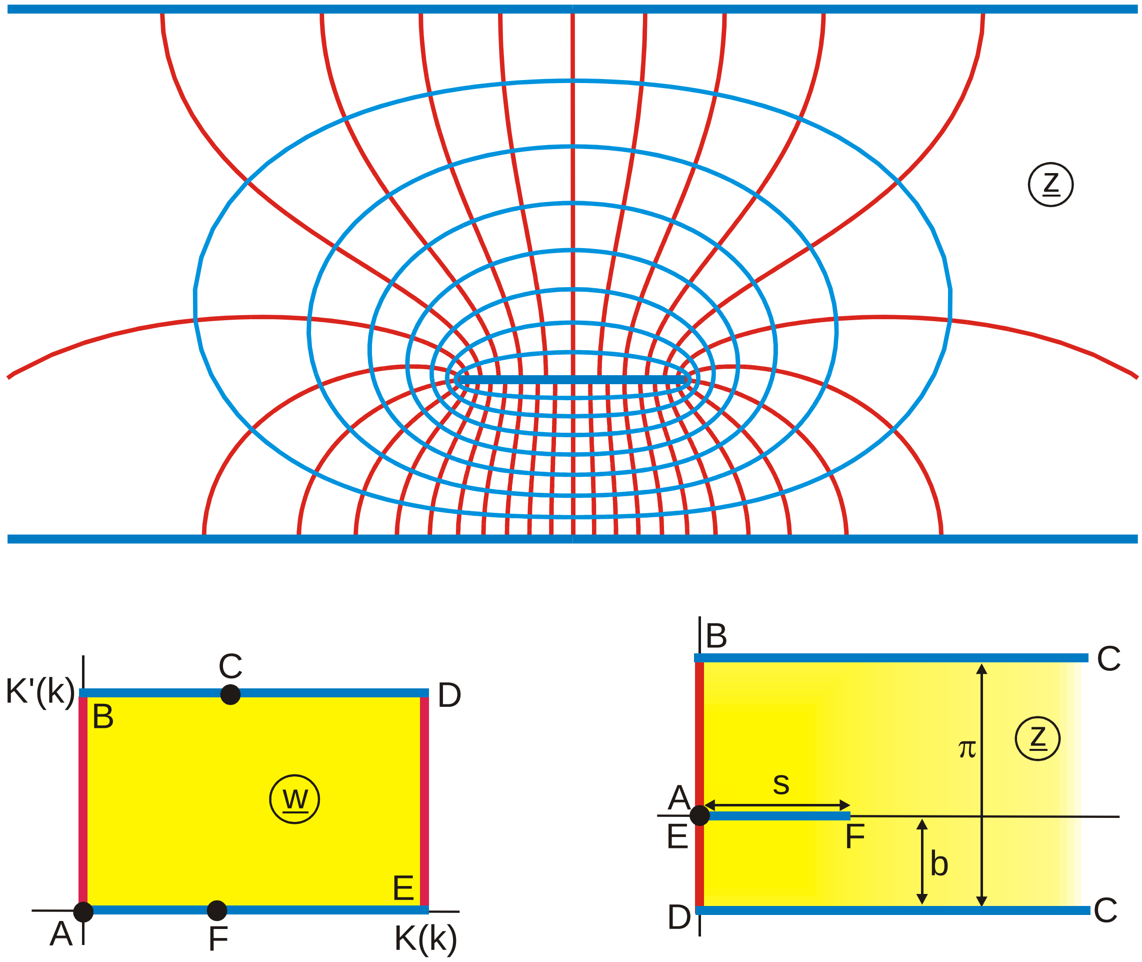


Abbildung H 7.3

$$z = \ln \frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w+a),k\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w-a),k\right]}$$

$$a = b\frac{K(k)}{\pi}$$

$$h = \ln \frac{\vartheta_4\left[\frac{\pi}{2K(k)}(u_G+a),k\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(u_G-a),k\right]} \qquad u_F = a$$

$$\sigma = \frac{Z_e(a,k)}{k^2\,\mathrm{sn}(a)\left[\mathrm{cn}(a)\,\mathrm{dn}(a)+\mathrm{sn}(a)\,Z_e(a)\right]} \qquad u_G = F_a\left(\sqrt{\sigma},k\right)$$

$0 \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

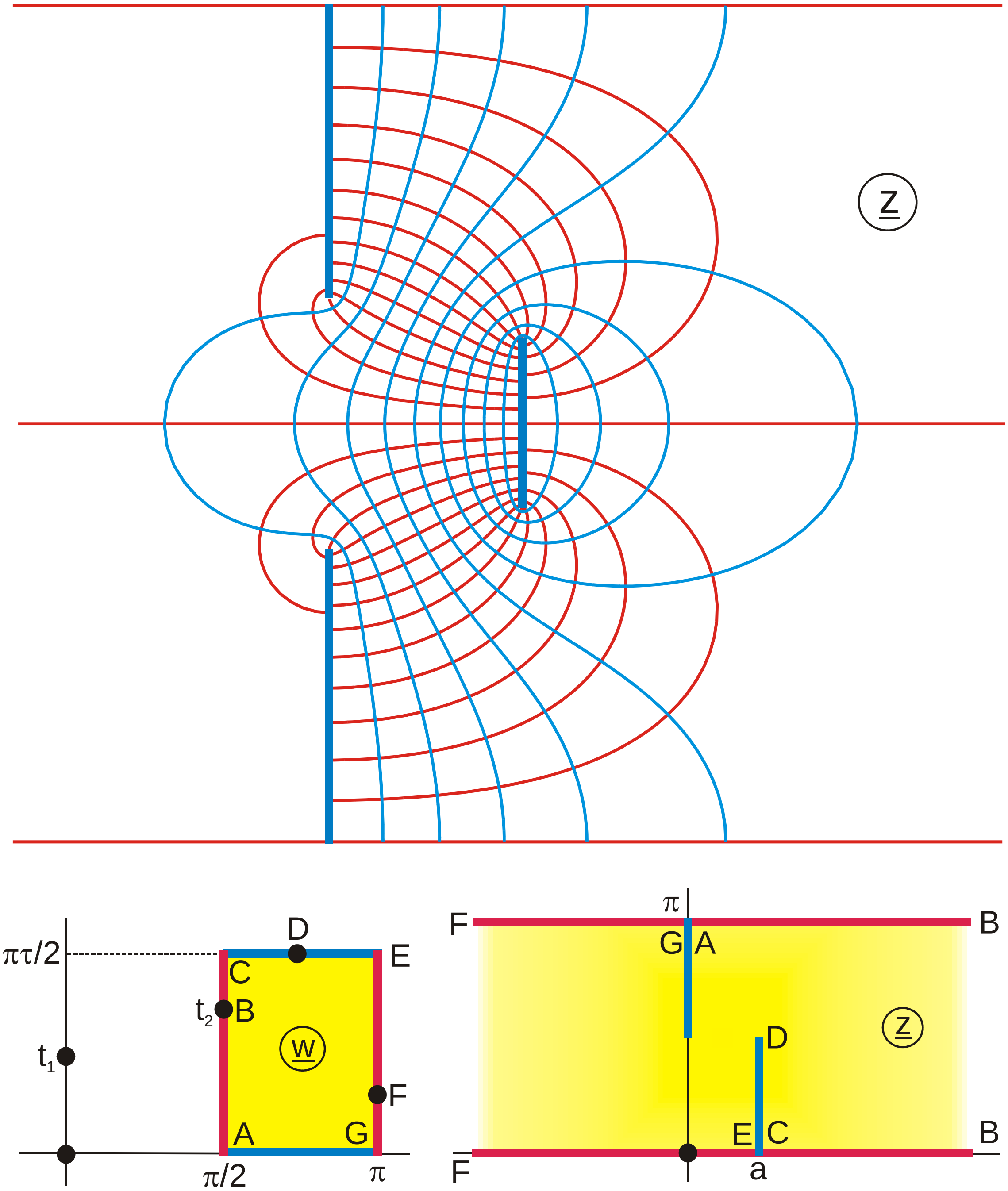


Abbildung H 7.4

$$z = \ln \frac{\vartheta_1\left[\left(w - t_1\right), \tau\right] \vartheta_1\left[\left(w - t_2^*\right), \tau\right]}{\vartheta_1\left[\left(w - t_2\right), \tau\right] \vartheta_1\left[\left(w - t_1^*\right), \tau\right]}$$

$$a = \pi\left(\operatorname{Im} t_2 - \operatorname{Im} t_1\right)$$

$\pi/2 \le u \le \pi$ $\qquad$ $0 \le v \le \pi\tau/2$

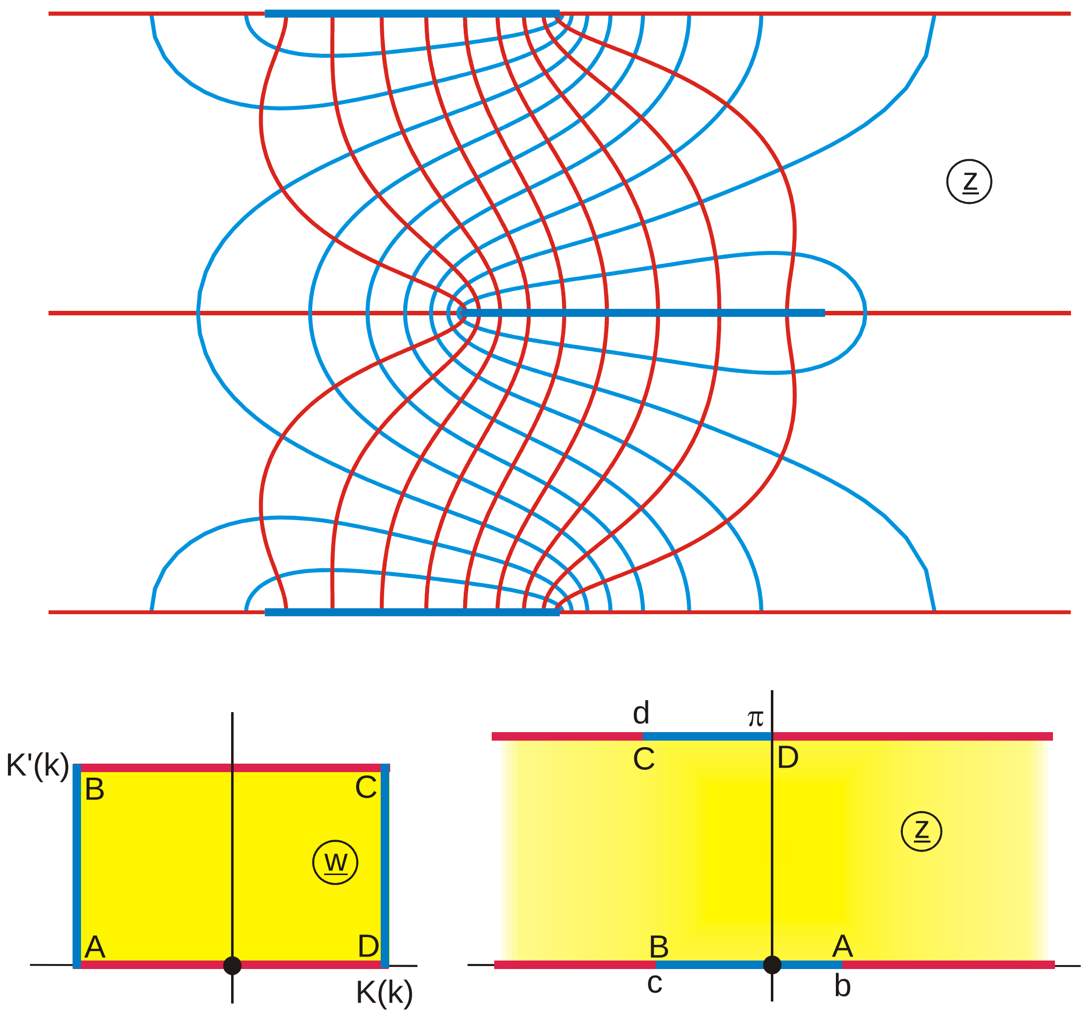


Abbildung H 7.5

$$z = \ln\left\{a - 1 - a\frac{k + \sigma\,\mathrm{sn}(w,k)}{\sigma + k\,\mathrm{sn}(w,k)}\right\}$$

gegeben: b, c, d

$$a = \frac{\exp(b) + 1}{2} \qquad a_1 = \frac{\exp(c) + 1 - a}{a}$$

$$a_2 = \frac{1 - a - \exp(d)}{a} \qquad \sigma = k\frac{k - a_1}{1 - k a_1}$$

$$k = \frac{1 - a_1 a_2}{a_1 - a_2} - \sqrt{\left(\frac{1 - a_1 a_2}{a_1 - a_2}\right)^2 - 1}$$

$-K(k) \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

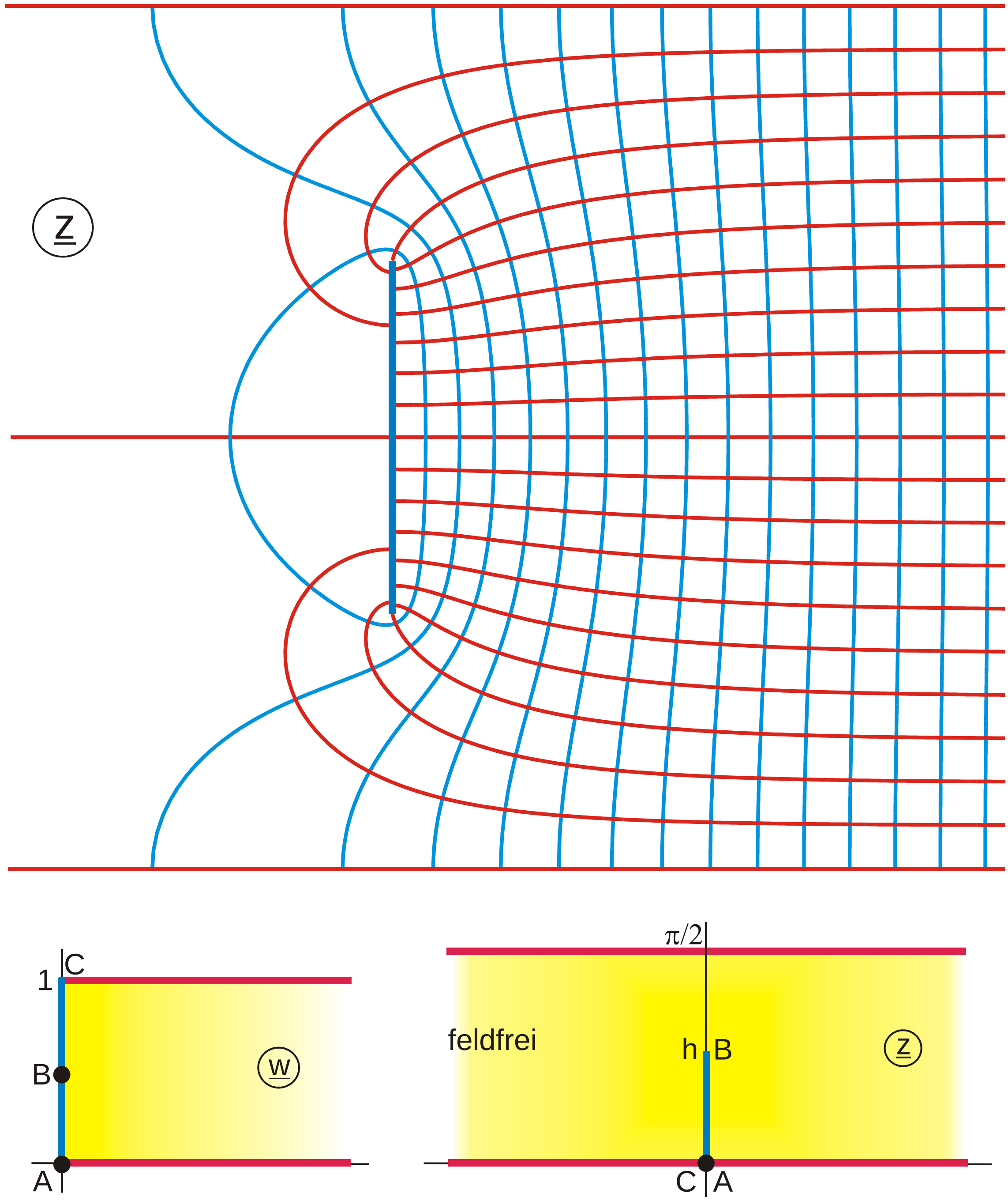
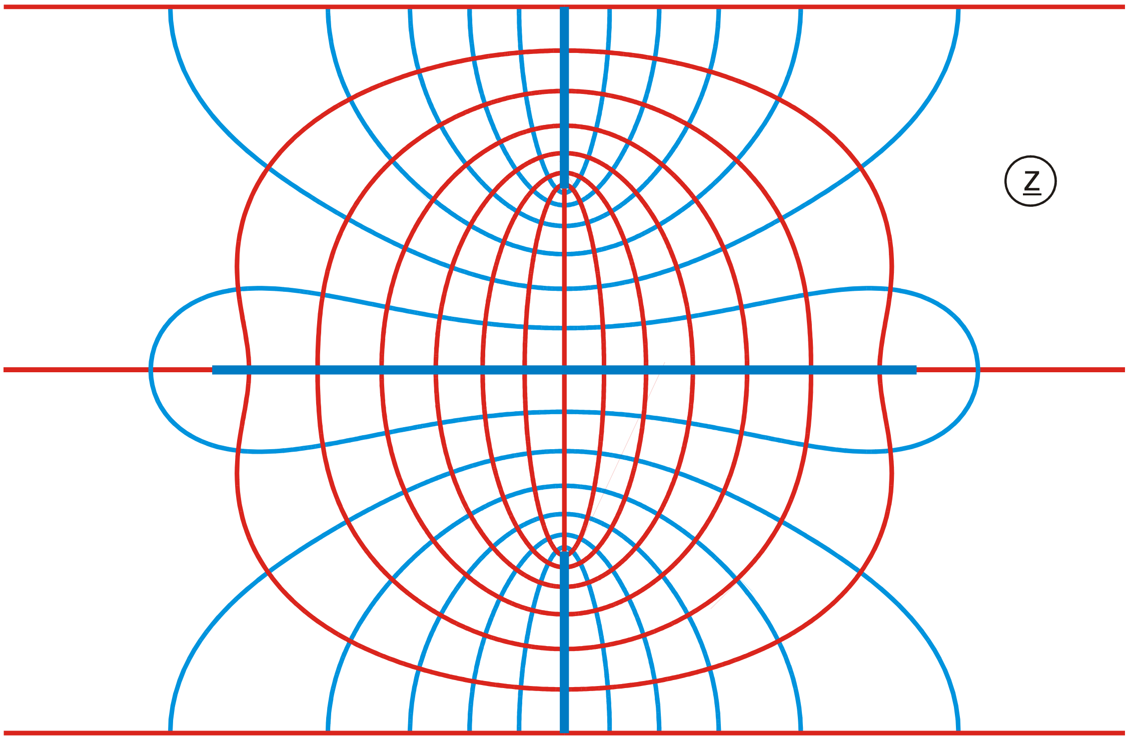


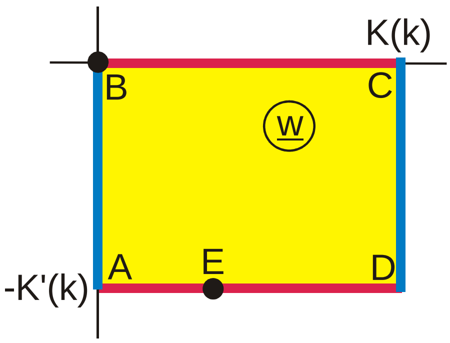
Abbildung H 7.6

$$z = \ln\frac{w_2 - a}{w_2 + a} - \ln\frac{w_2 - 1/a}{w_2 + 1/a}$$

$$w_2 = a\frac{w_1 + 1}{w_1 - 1} \qquad w_1 = \exp(\pi w)$$

$0 \le u \le 1{,}5$ $\qquad$ $0 \le v \le 1$





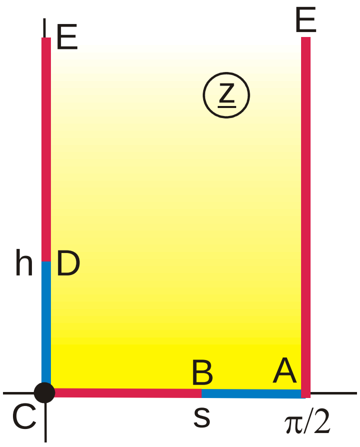


Abbildung H 7.7

$$z = \arctan\{a\,\mathrm{cn}(w,k)\}$$

a = tan s

$$k = \frac{1}{\sqrt{1 + \frac{\tanh^2 h}{a^2}}}$$

$0 \le u \le K(k)$ $-K'(k) \le v \le 0$

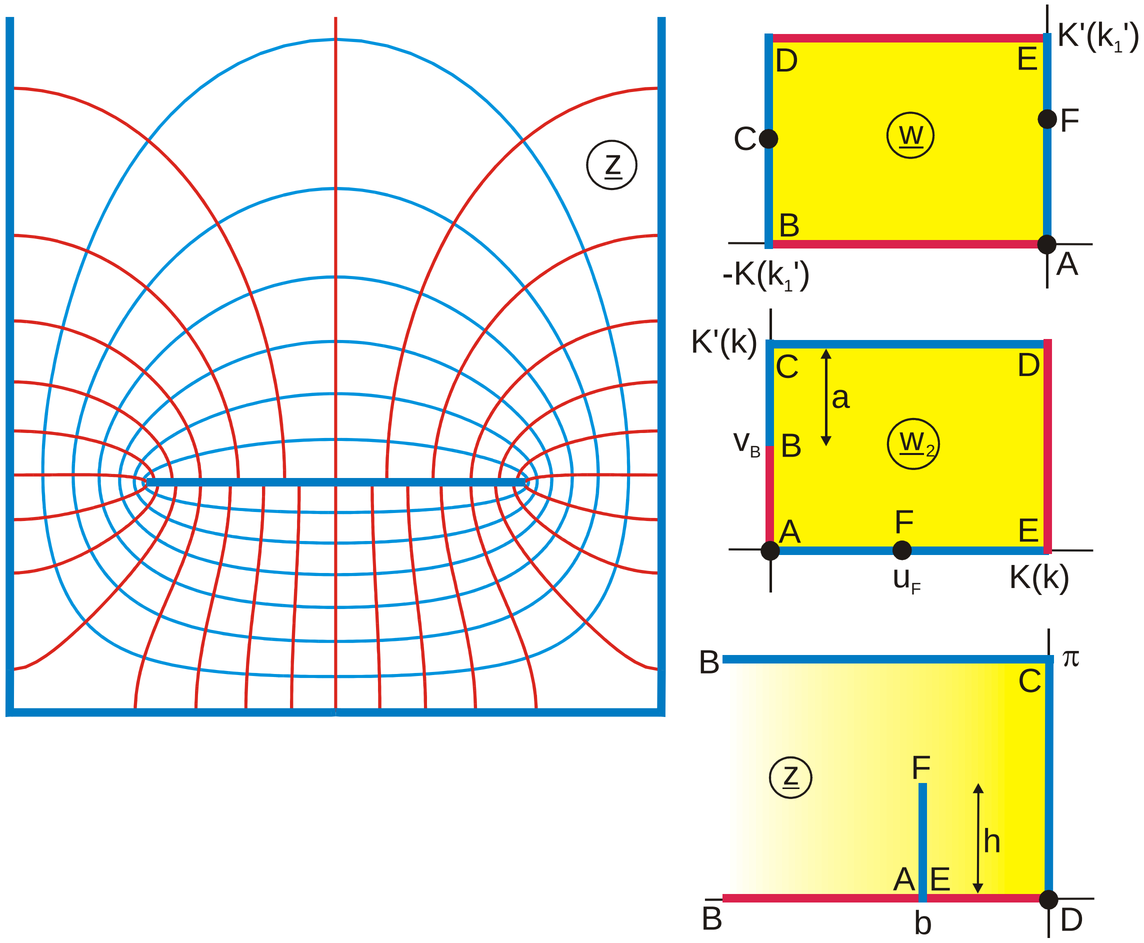


Abbildung H 7.8

$$z = \ln \frac{\vartheta_4\left[\frac{\pi}{2K(k)}\left(w_2 + ja\right), k\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}\left(w_2 - ja\right), k\right]} - b$$

gegeben: b, k

$$w_2 = -jF_a\left(w_1, k_1'\right)$$

$$w_1 = \frac{k_1'}{k'}\mathrm{sn}(w, k_1')$$

$$a = b\frac{K(k)}{\pi}$$

$$0 < a < K'(k)$$

$$\sigma = \frac{Z_e(ja,k)}{k^2\,\mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja) + \mathrm{sn}(ja)\,Z_e(ja)\right]}$$

$$v_B = K'(k) - a$$

$$h = 2\arg\vartheta_4\left[\frac{\pi}{2K(k)}\left(u_F + ja\right), k\right]$$

$$u_F = F_a\left(\sqrt{\sigma}, k\right)$$

$$k_1' = k'\mathrm{sn}(v_B, k')$$

$$-K(k_1') \le u \le 0$$

$$0 \le v \le K'(k_1')$$

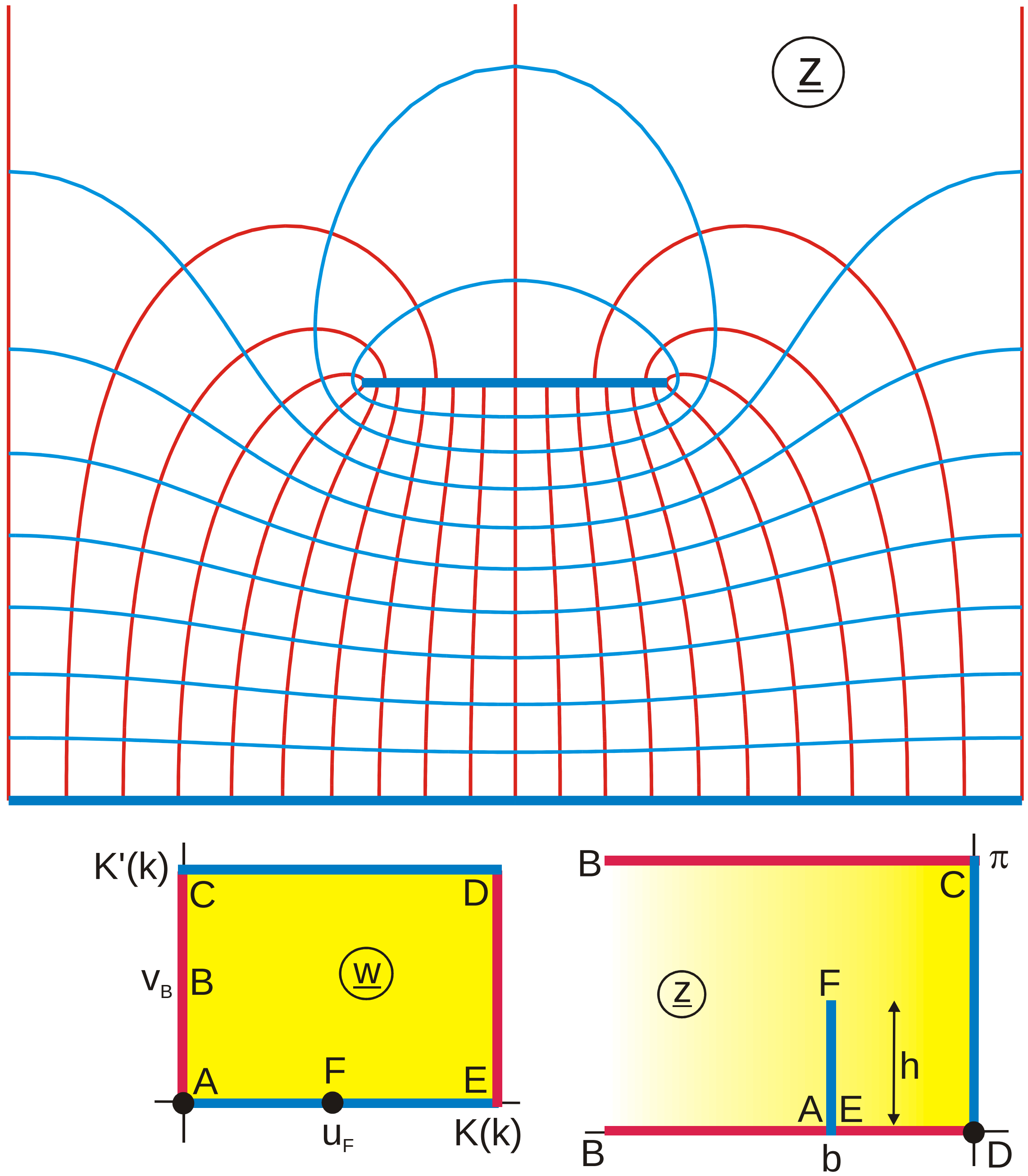


Abbildung H 7.9

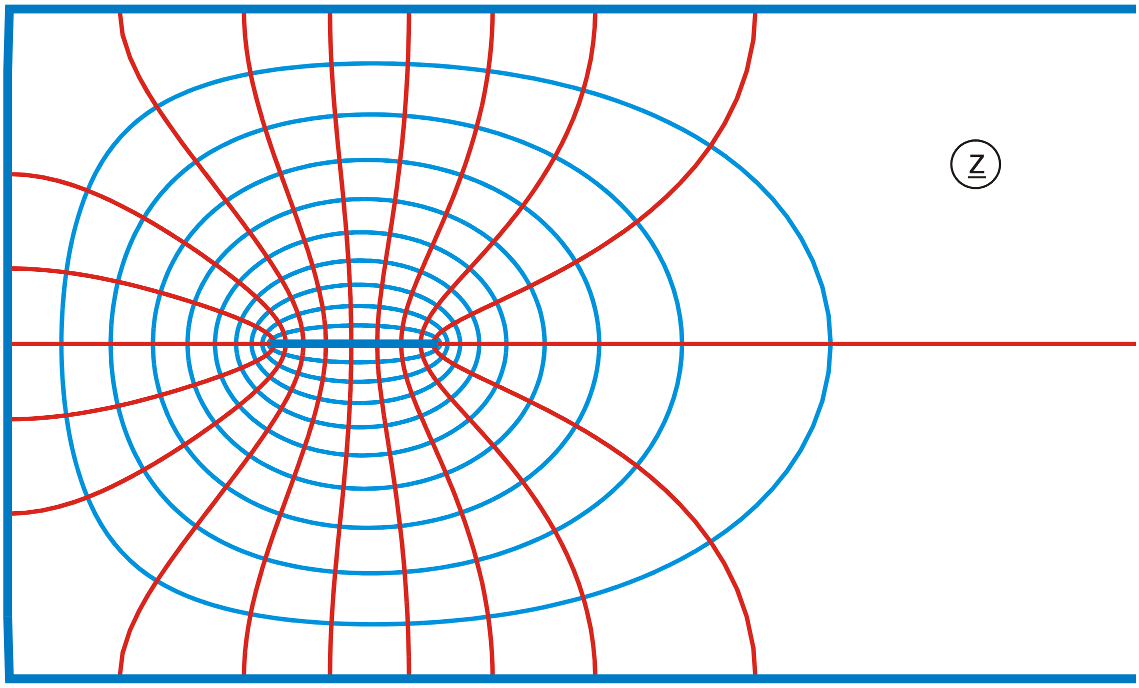
$$z = \ln \frac{\vartheta_4\left[\frac{\pi}{2K(k)}(w + ja), \tau\right]}{\vartheta_4\left[\frac{\pi}{2K(k)}(w - ja), \tau\right]} - b \qquad a = b\frac{K(k)}{\pi}$$

gegeben: b, k $\qquad 0 < a < K'(k)$

$$\sigma = \frac{Z_e(ja,k)}{k^2 \, \mathrm{sn}(ja)\left[\mathrm{cn}(ja)\,\mathrm{dn}(ja) + \mathrm{sn}(ja)\, Z_e(ja)\right]} \qquad v_B = K'(k) - a$$

$$h = 2 \arg \vartheta_4\left[\frac{\pi}{2K(k)}(u_F + ja), \tau\right] \qquad u_F = F_a\left(\sqrt{\sigma}, k\right)$$

$\tau = K'(k)/K(k)$ $\qquad -K(k) \leq u \leq 0$ $\qquad 0 \leq v \leq K'(k)$



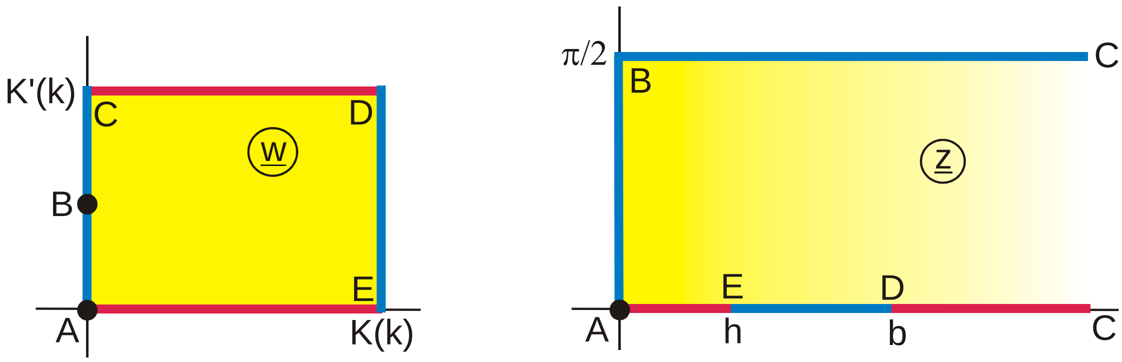


Abbildung H 7.10

$z = ar\sinh\{a\,\mathrm{sn}(w,k)\}$

$\mathrm{k} = \dfrac{\mathrm{a}}{\sinh \mathrm{b}}$

h = arsinh a

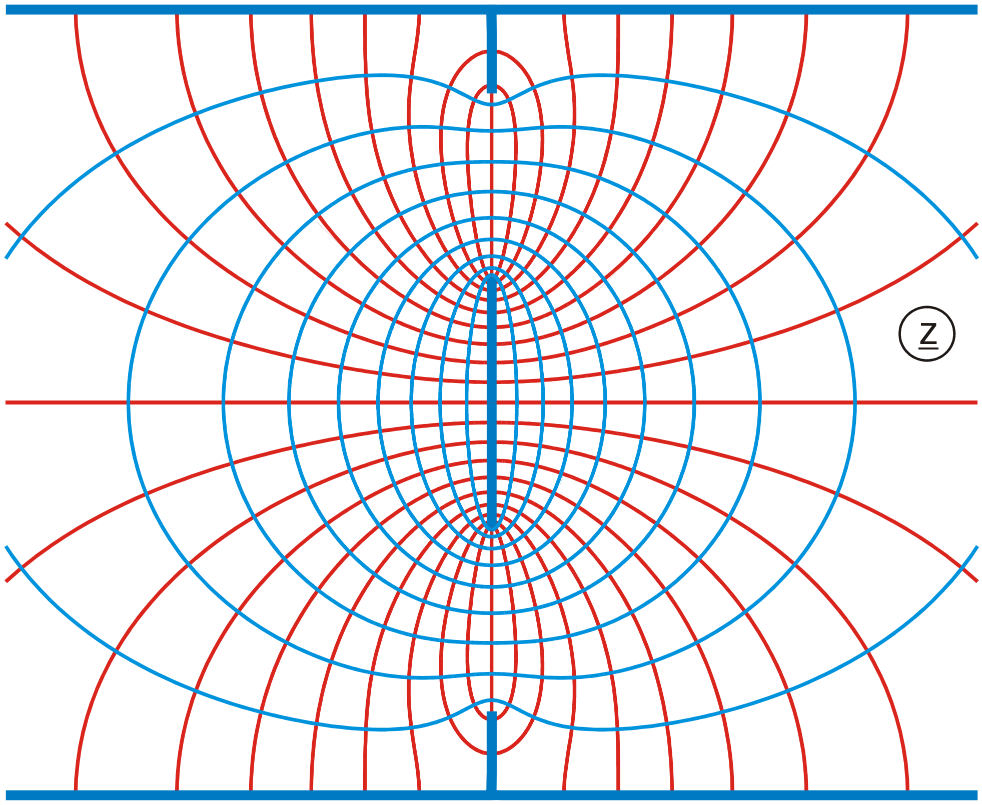
b = arsinh(a/k)

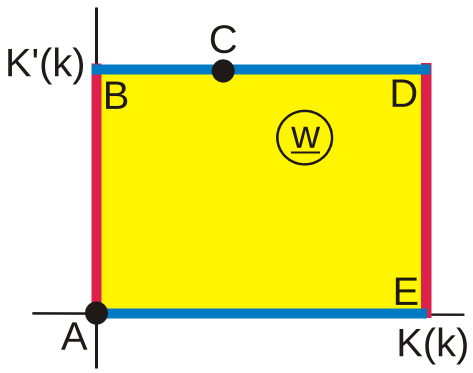
$v_B = \operatorname{Im} F_a\left(\dfrac{j}{a}, k\right)$

a = sinh h

$0 \le \mathrm{u} \le \mathrm{K(k)}$

$0 \le \mathrm{v} \le \mathrm{K'(k)}$





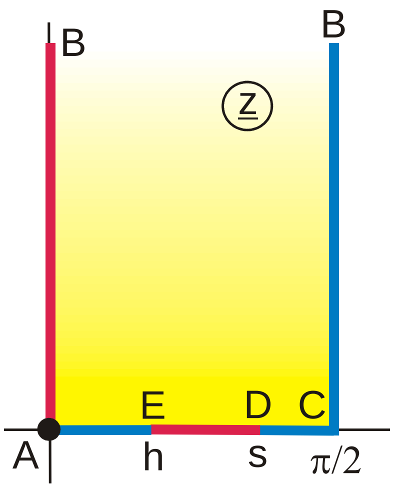


Abbildung H 7.11

$$z = \arcsin\left\{ak\,\mathrm{sn}(w,k)\right\}$$

$k = \dfrac{\sin b}{a}$ $\qquad$ $a = \sin c$

$$u_C = F_a\left(\frac{1}{ak}, k\right)$$

$0 \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

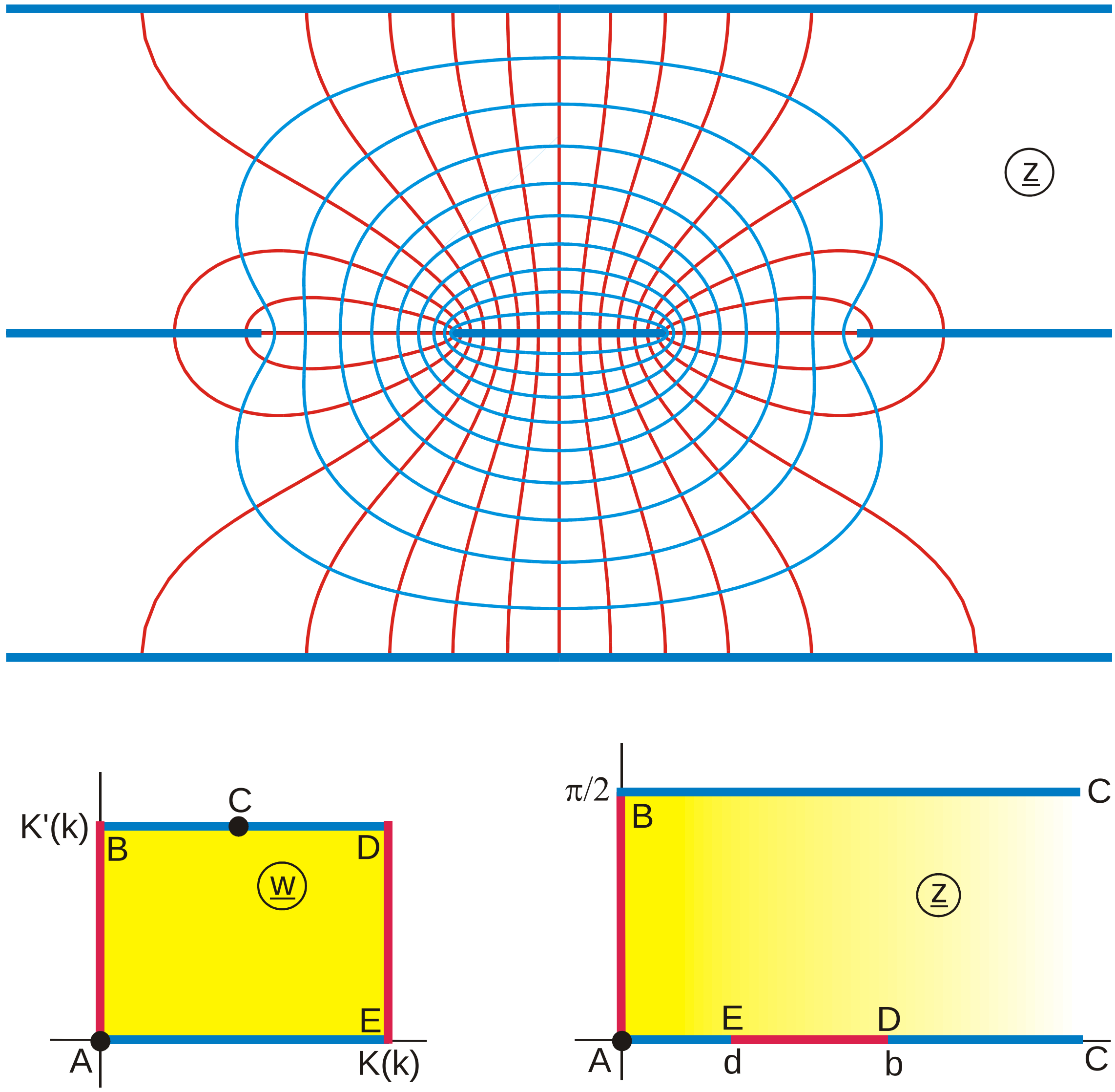


Abbildung H 7.12

$z = \mathrm{ar\,tanh}\{ak\,\mathrm{sn}(w,k)\}$

a ≤ 1

a = tanh b

k = tanh (d)/a

$u_C = F_a(a,k)$

gegeben: d, b

0 ≤ u ≤ K(k)

0 ≤ v ≤ K'(k)

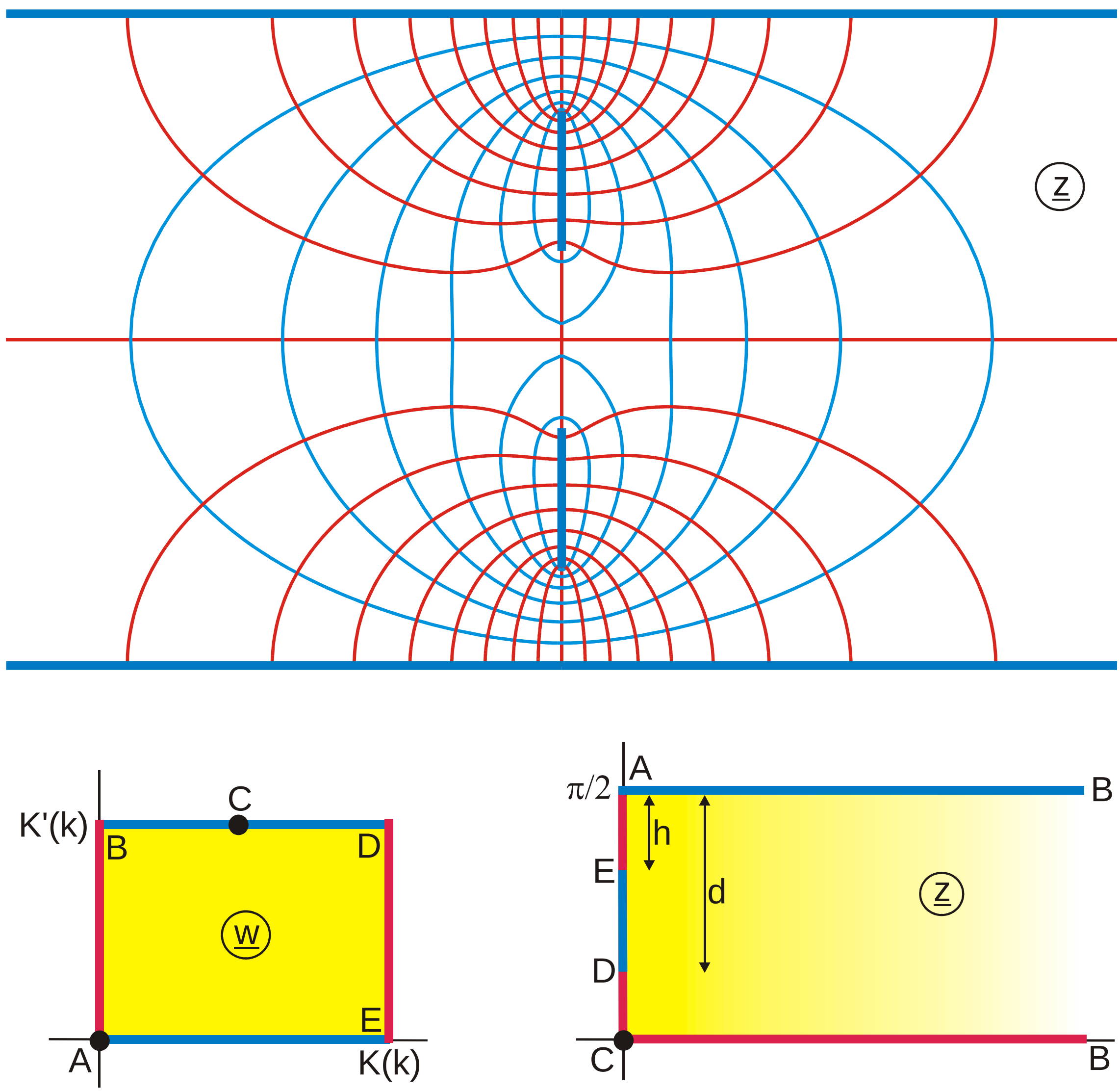


Abbildung H 7.13

$$z = j\left[\frac{\pi}{2} - \arcsin\left\{ak\,\mathrm{sn}(w,k)\right\}\right]$$

$a \leq 1$

$k = \sin(h)/a$

$a = \sin d$

$u_C = F_a(a,k)$

gegeben: d, h

$0 \leq u \leq K(k)$

$0 \leq v \leq K'(k)$

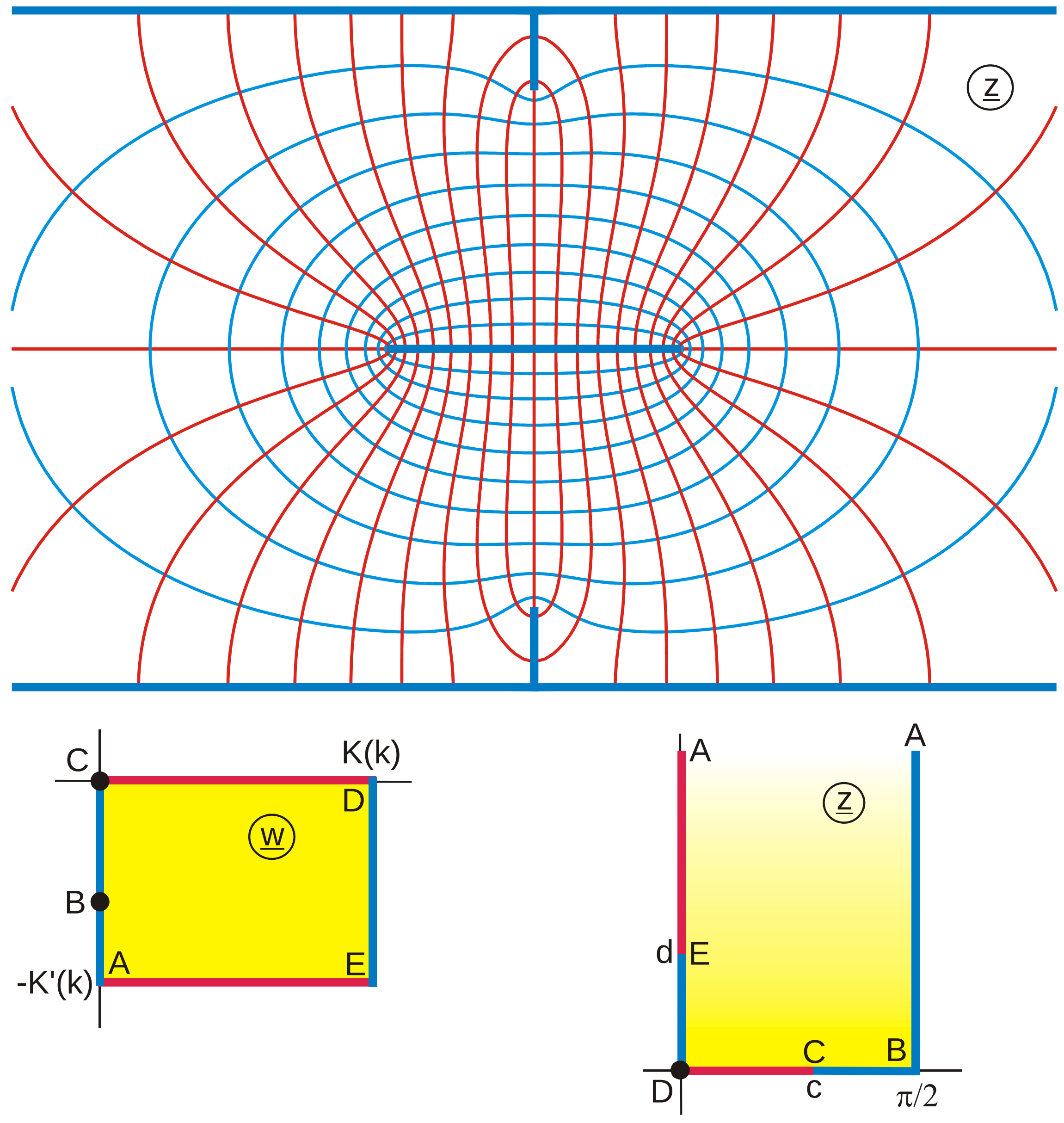


Abbildung H 7.14

$z = \arcsin\{b\,\mathrm{cn}(w,k)\}$

b = sin c

a = sinh (d)/b

gegeben: d, c

$0 \le u \le K(k)$ $-K'(k) \le v \le 0$

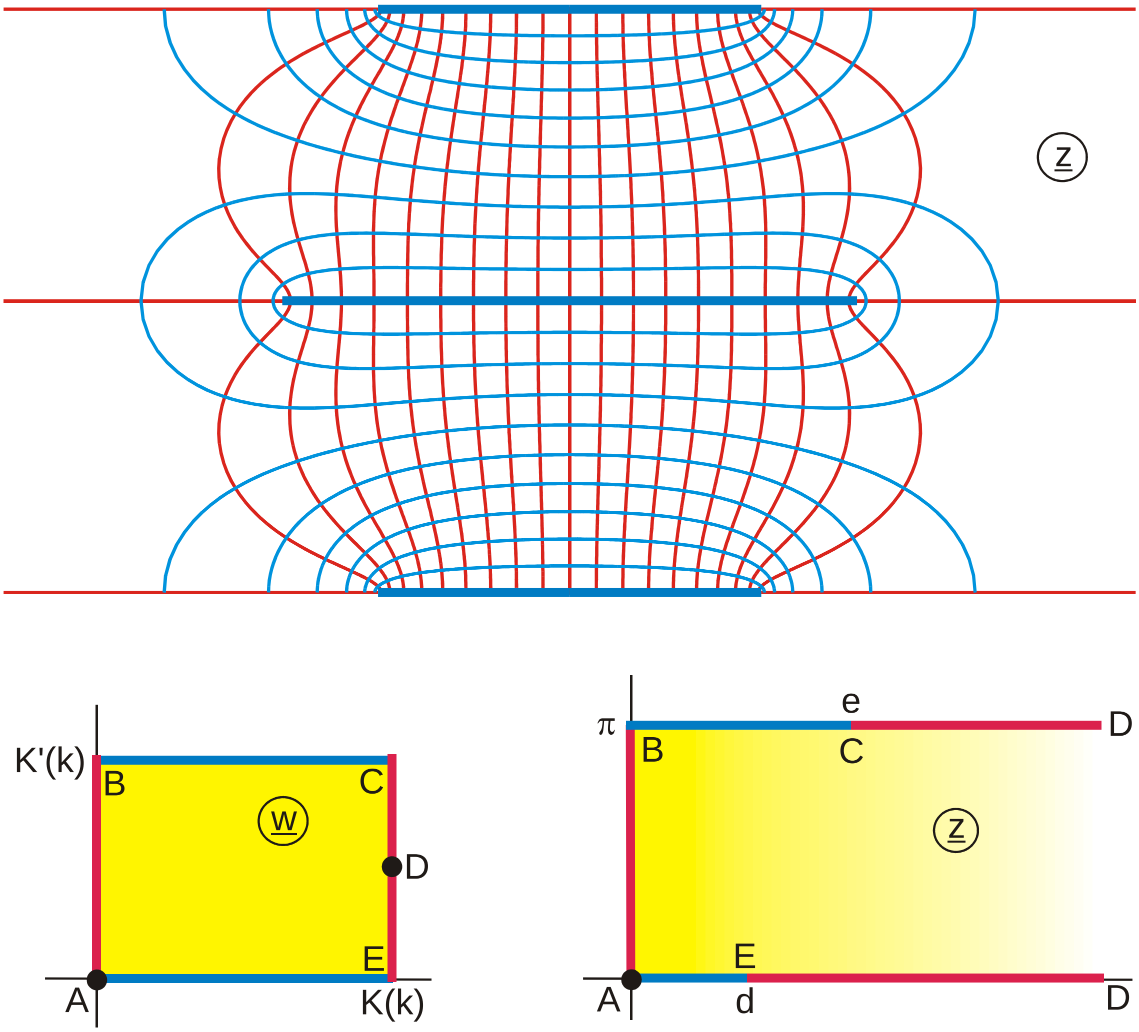


Abbildung H 7.15

$z = \ln w_1$

$w_1 = \dfrac{1 + a\,\mathrm{sn}(w,k)}{1 - a\,\mathrm{sn}(w,k)}$

$k = a\dfrac{c-1}{c+1}$

$a = \dfrac{b-1}{b+1}$

$b = \exp(d)$

$v_D = \mathrm{Im}\,F_a\left(\dfrac{1}{a},k\right)$

$c = \exp(e)$

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

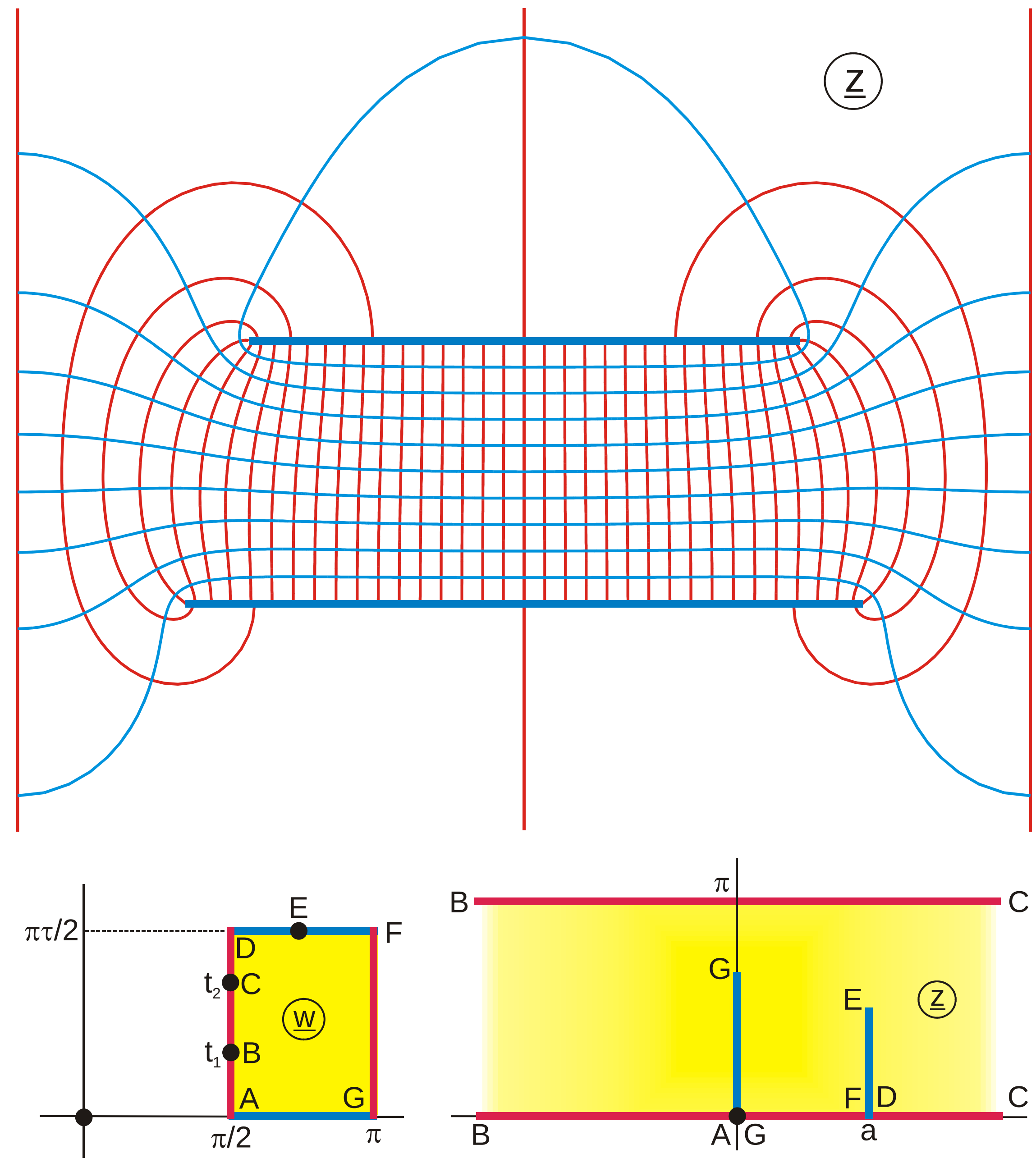


Abbildung H 7.16

$$z = \ln \frac{\vartheta_1\left[\left(w-t_1\right),\tau\right]\vartheta_1\left[\left(w-t_2^*\right),\tau\right]}{\vartheta_1\left[\left(w-t_2\right),\tau\right]\vartheta_1\left[\left(w-t_1^*\right),\tau\right]}$$

$$a = \pi\left(\operatorname{Im} t_2 - \operatorname{Im} t_1\right)$$

$\pi/2 \le u \le \pi$ $\qquad$ $0 \le v \le \pi\tau/2$

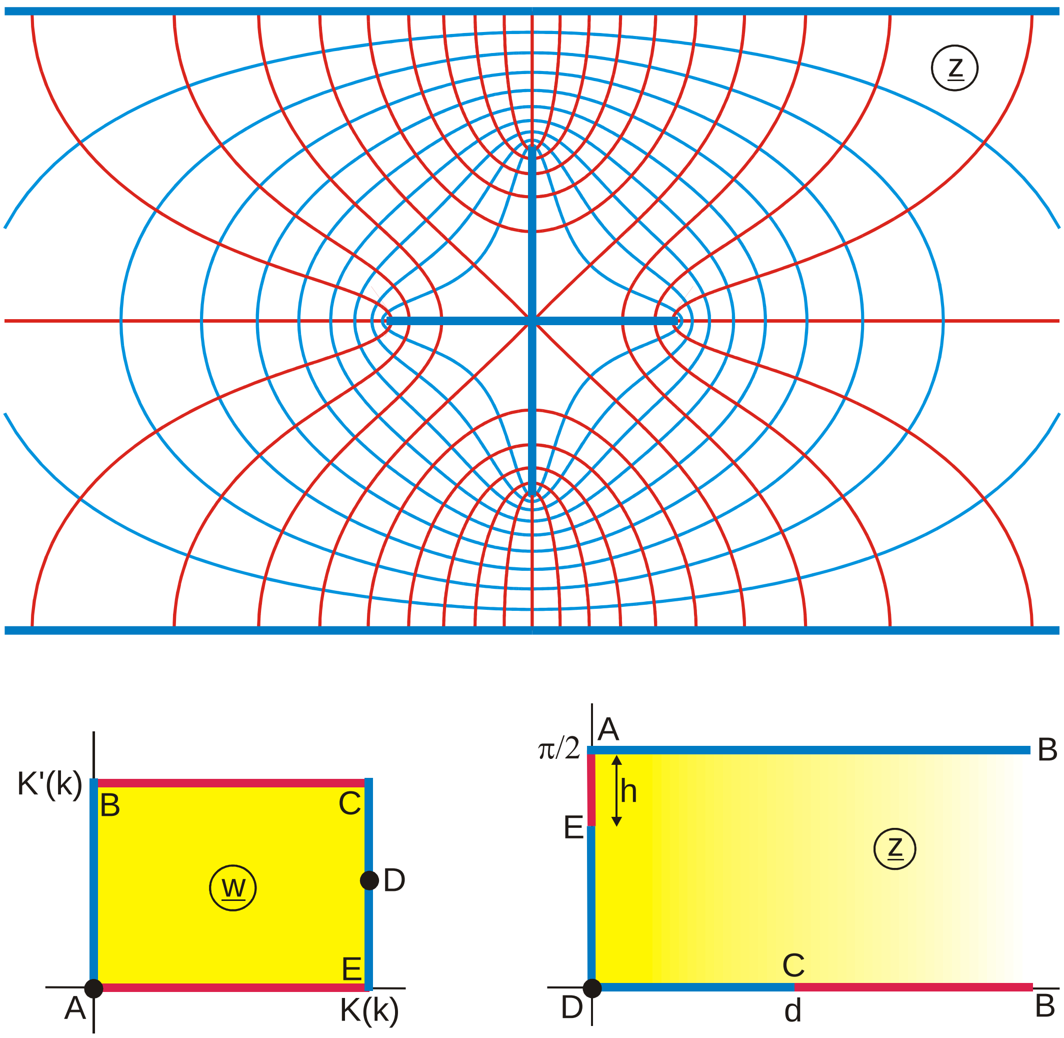


Abbildung H 7.17

$$z = j\left[\frac{\pi}{2} - \arcsin\left\{ak\,\mathrm{sn}(w,k)\right\}\right]$$

a ≥ 1

a = cosh d

k = sin (h)/a

$$v_D = \mathrm{Im}\,F_a\left(\frac{1}{ak},k\right)$$

gegeben: d, h

0 ≤ u ≤ K(k)

0 ≤ v ≤ K'(k)

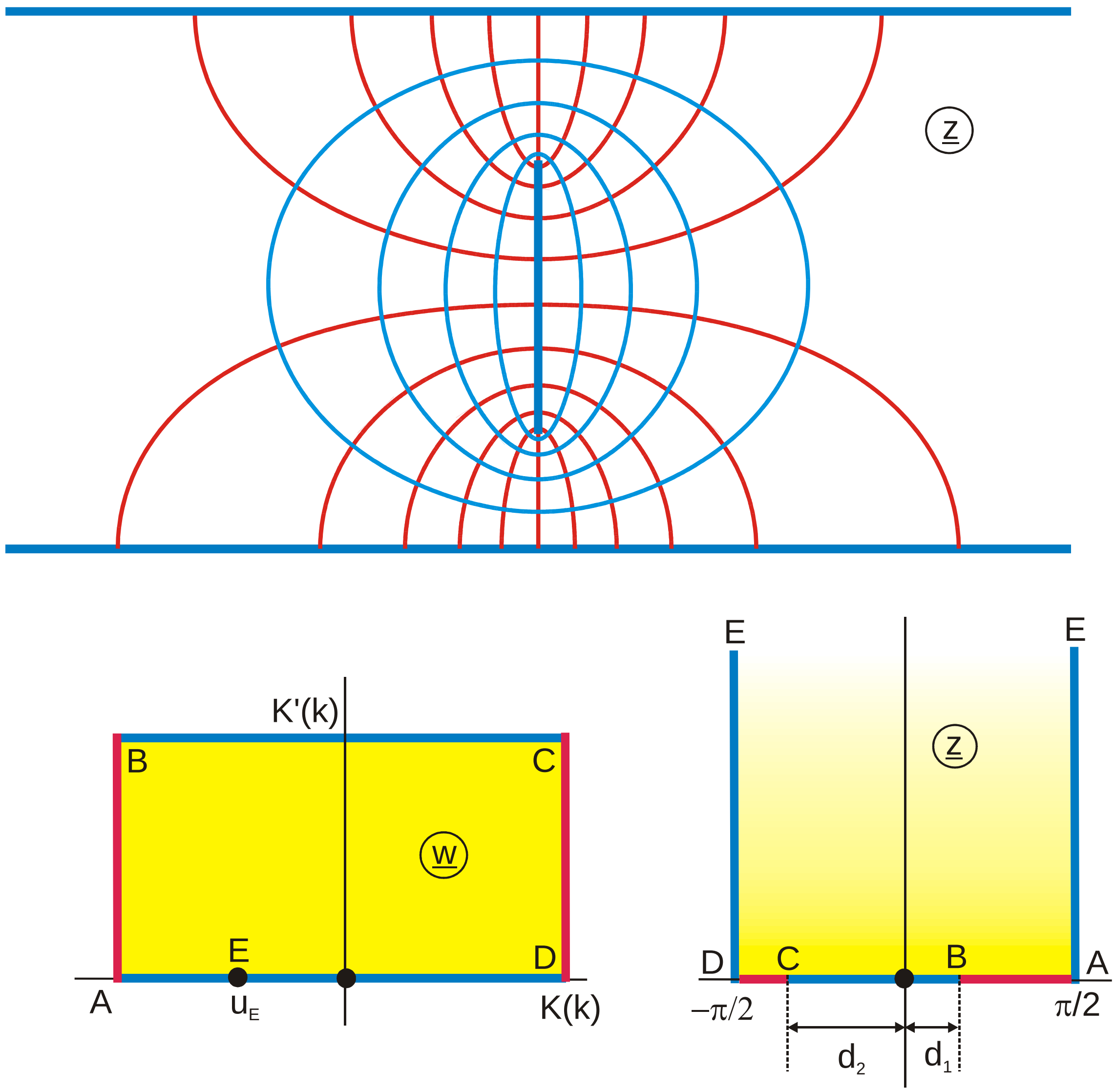


Abbildung H 7.18

$z = \arcsin(w_1)$

$$w_1 = -\frac{k + \sigma\,\mathrm{sn}(w,k)}{\sigma + k\,\mathrm{sn}(w,k)}$$

$-K(k) \le u \le K(k)$

$0 \le v \le K'(k)$

$$d_1 = \arcsin\frac{k^2 - \sigma}{k(1-\sigma)}$$

$$d_2 = \arcsin\left(-\frac{k^2 + \sigma}{k(1+\sigma)}\right)$$

$a_1 = \sin d_1$

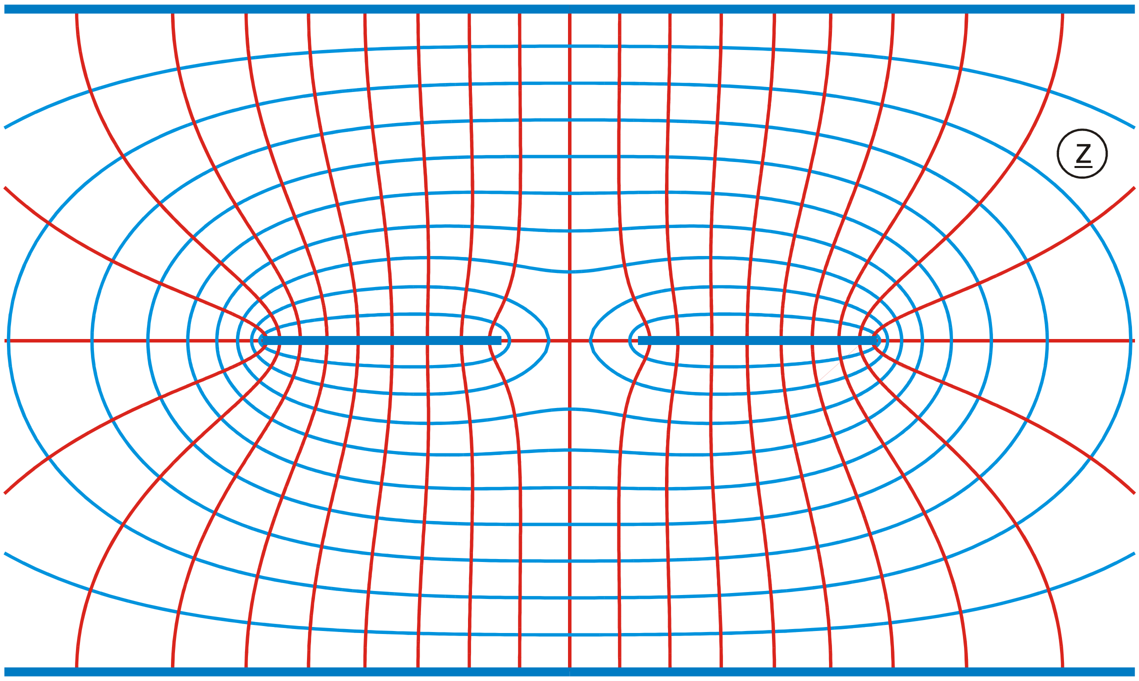
$a_2 = \sin d_2$

$$a = \frac{1 - a_1 a_2}{a_1 - a_2}$$

$$\sigma = k\frac{k - a_1}{1 - k a_1}$$

$$k = a - \sqrt{a^2 - 1}$$

$$u_E = F_a\left(-\frac{\sigma}{k}, k\right)$$



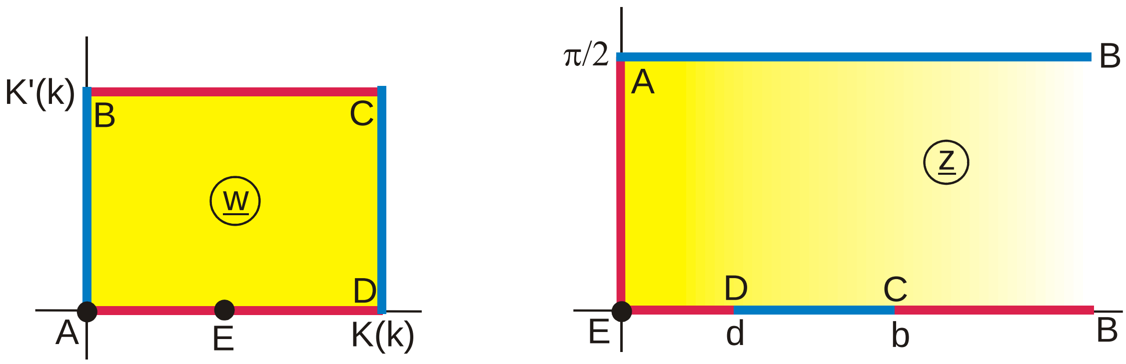


Abbildung H 7.19

$$z = j\left[\frac{\pi}{2} - \arcsin\{a\,\mathrm{sn}(w,k)\}\right]$$

a ≥ 1

a = cosh d

k = a/cosh b

$u_E = F_a(1/a,k)$

gegeben: d, b

0 ≤ u ≤ K(k)

0 ≤ v ≤ K'(k)

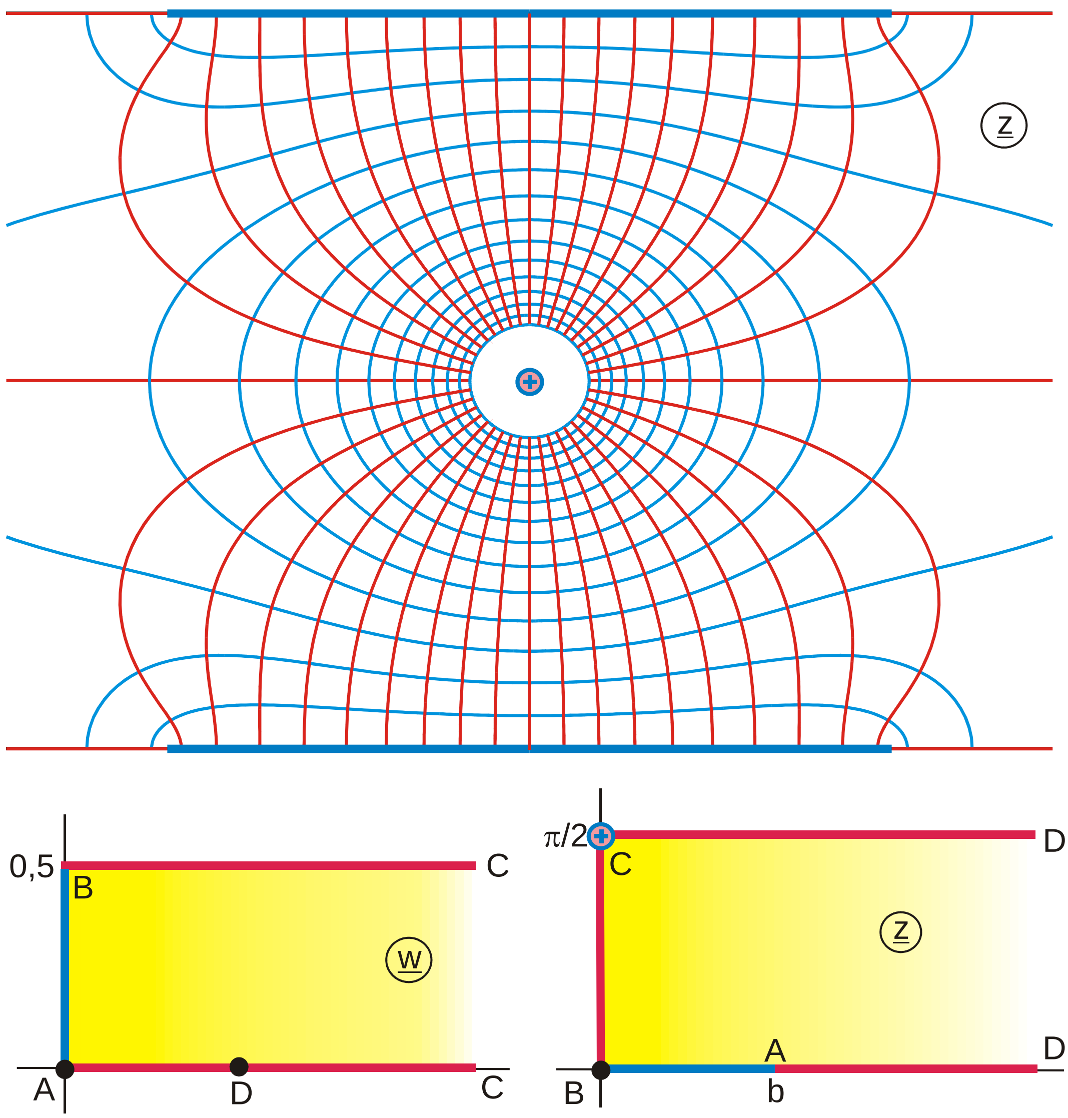


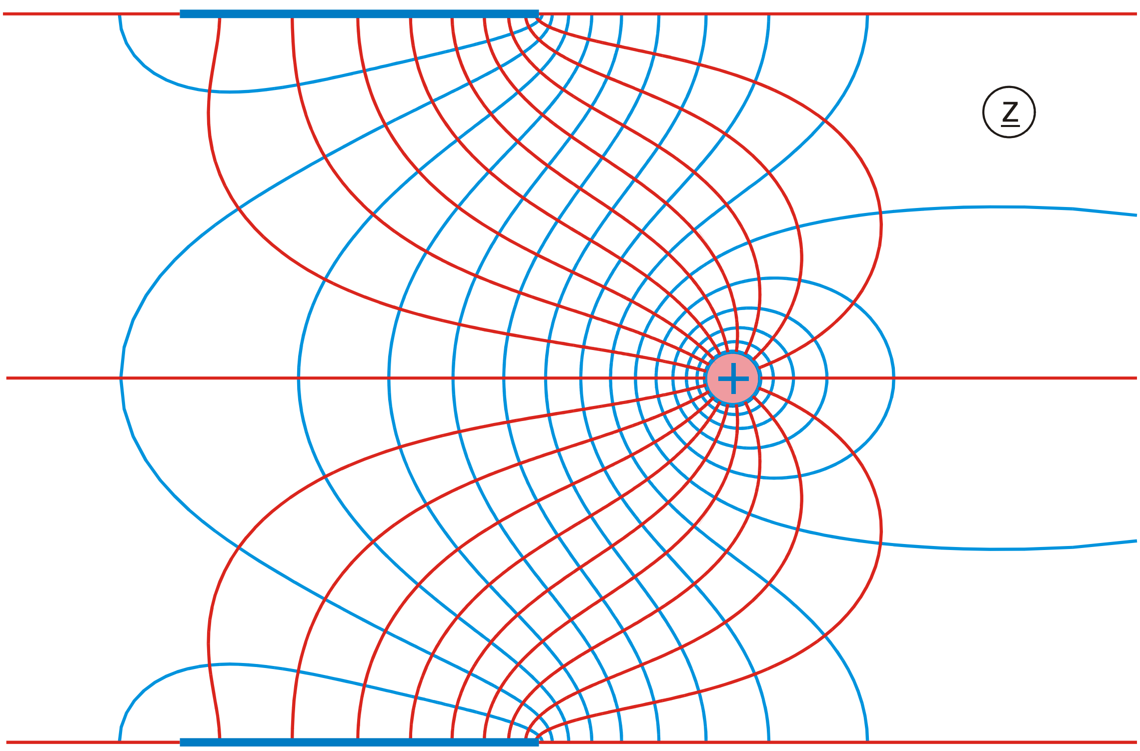
Abbildung H 8

$$z = ar\tanh\{\sigma \cosh(w\pi)\}$$

$\sigma = \tanh b$

$$u_D = \frac{1}{\pi} \operatorname{ar}\cosh(1/\sigma)$$

$0 \leq u \leq 0{,}7$ $0 \leq v \leq 0{,}5$



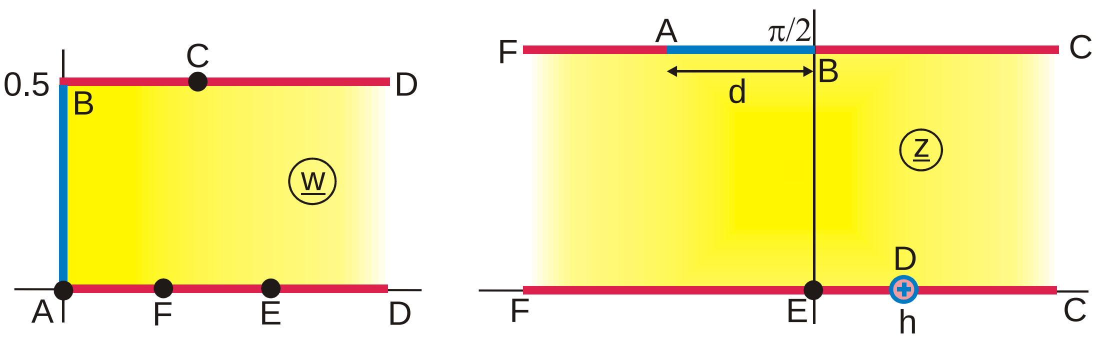


Abbildung H 8.1

$$z = ar\tanh\left\{(a+b)\tanh^2(w\pi) - b\right\}$$

b = 1/tanh d

a = tanh h

$$u_F = \frac{1}{\pi}\operatorname{ar\,tanh}\sqrt{\frac{b-1}{b+a}}$$

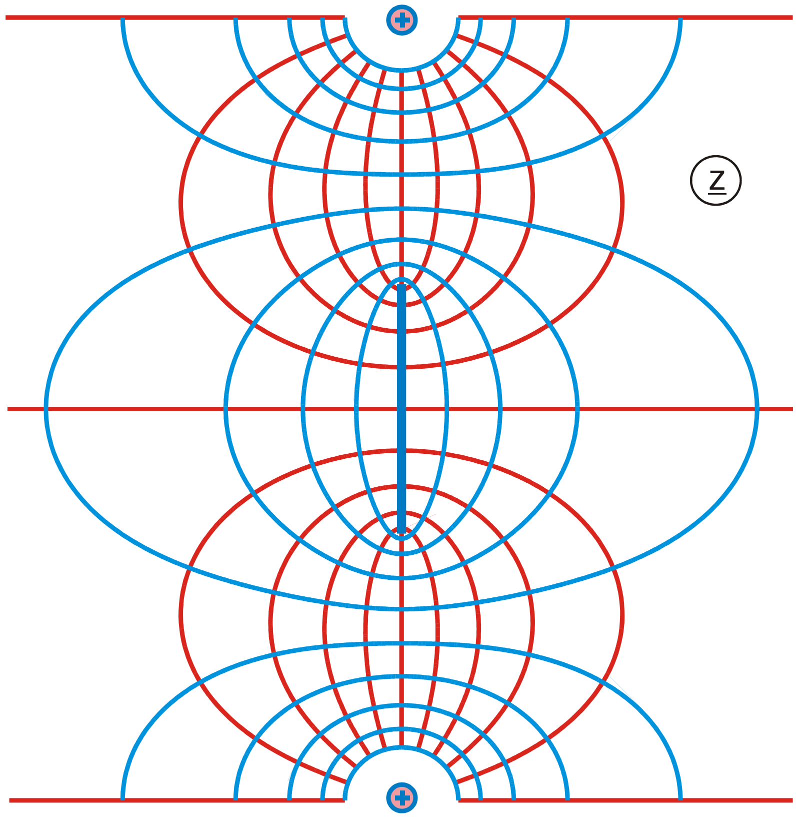
$$u_C = \frac{1}{\pi}\operatorname{ar\,tanh}\sqrt{\frac{b+a}{b+1}}$$

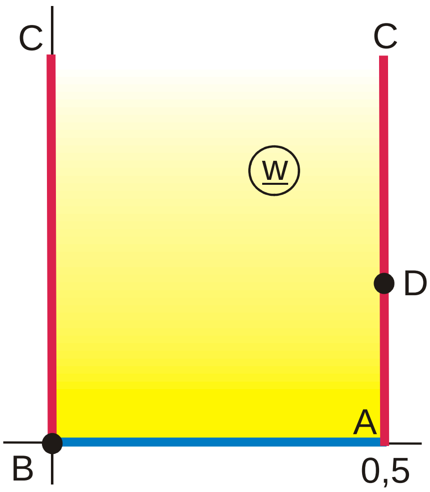
$$u_E = \frac{1}{\pi}\operatorname{ar\,tanh}\sqrt{\frac{b}{b+a}}$$

b > 1 und a < 1

$0 \leq u \leq 0{,}75$

$0 \leq v \leq 0{,}5$





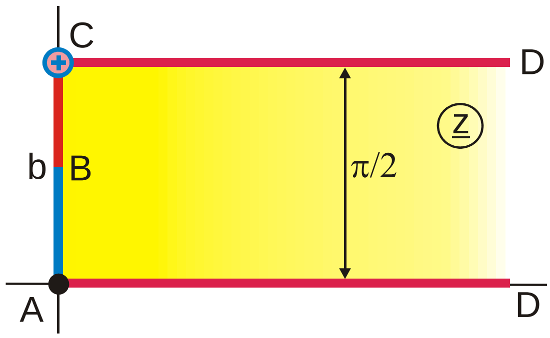


Abbildung H 8.2

$z = ar\tanh\{j\sigma\cos(w\pi)\}$

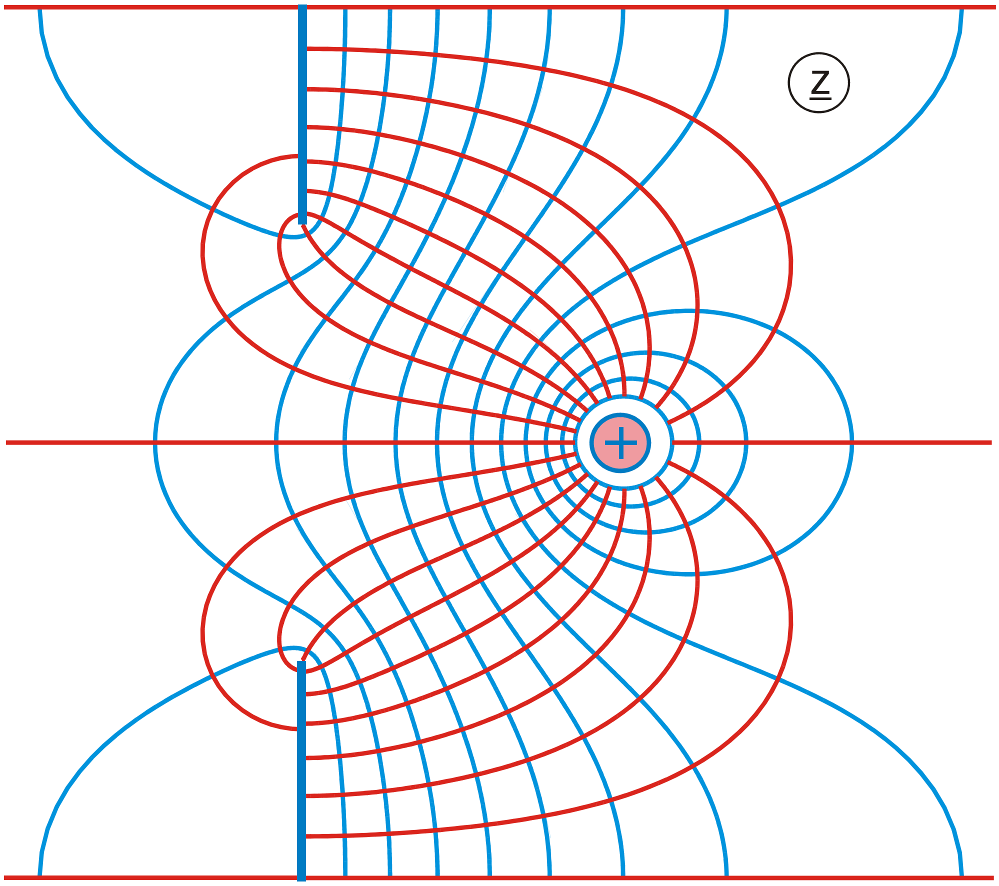
$\sigma \geq 0$

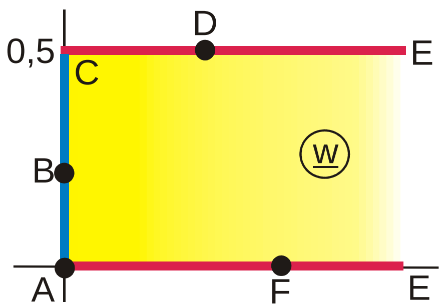
$\sigma = \tan b$

$$v_D = \frac{1}{\pi} ar\sinh\frac{1}{\sigma}$$

$0 \leq u \leq 0{,}5$

$0 \leq v \leq 0{,}8$





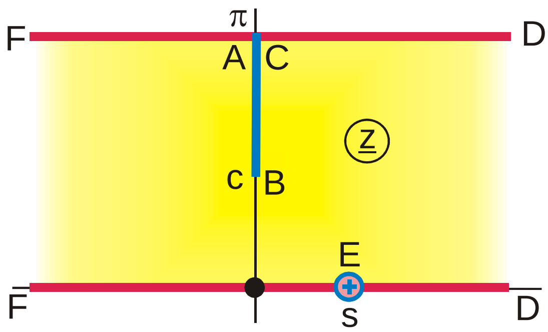


Abbildung H 8.3

z = ln w3

$$w_3 = \frac{w_2 + j}{w_2 - j}$$

$$w_2 = -2b\frac{w_1}{1 + w_1^2}$$

w1 = ja /tanh(wπ)

gegeben: c, s

b = 1/tan(c/2)

$$a = \sqrt{1 + \left(b\tanh\frac{s}{2}\right)^2} - b\tanh\frac{s}{2}$$

$$v_B = \frac{1}{\pi}\arctan a$$

$$u_D = \frac{1}{\pi}ar\tanh\frac{-a}{b + \sqrt{1 + b^2}}$$

s = exp(h)

0 ≤ u ≤ 0,6

0 ≤ v ≤ 0,5

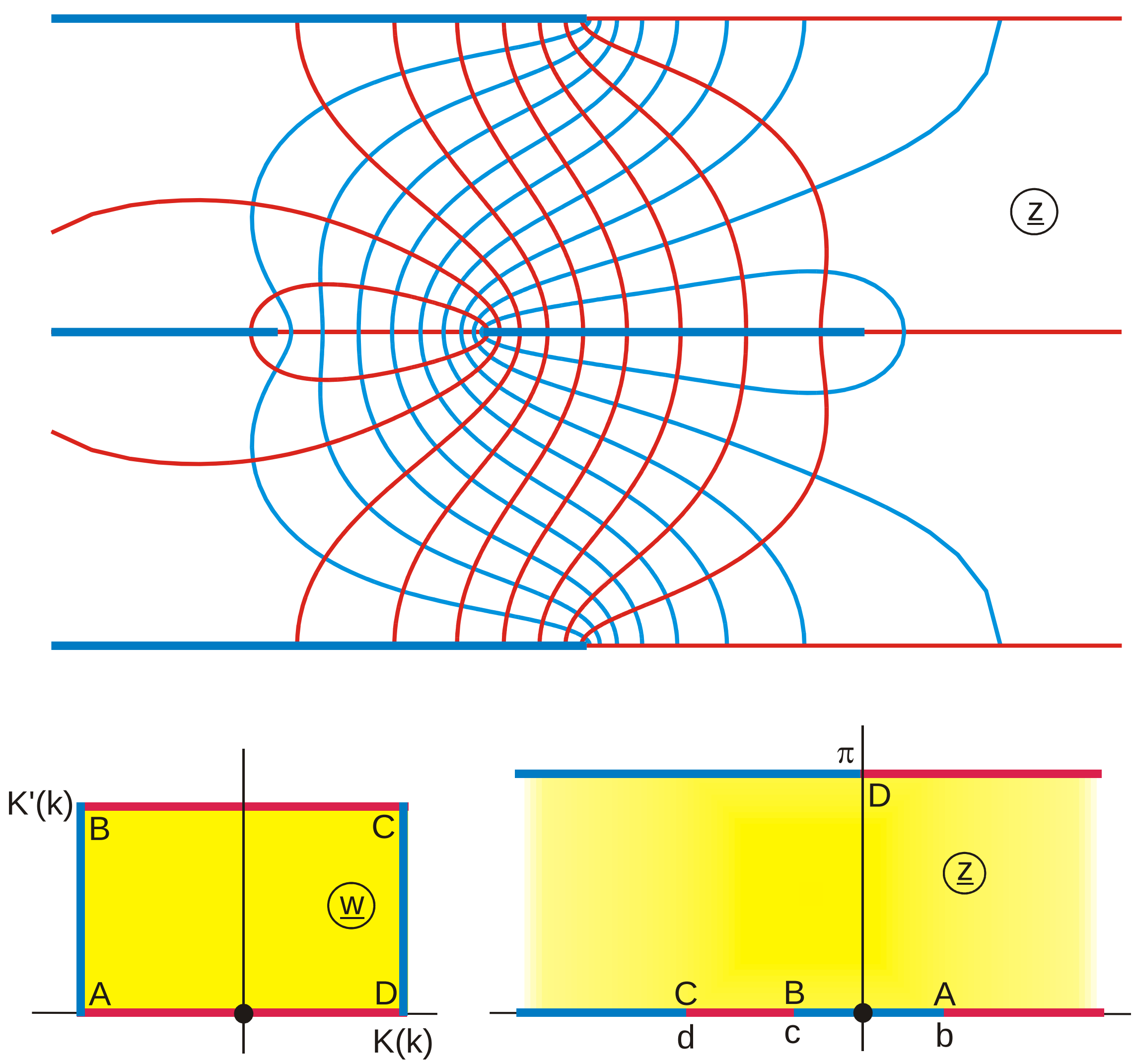


Abbildung H 9

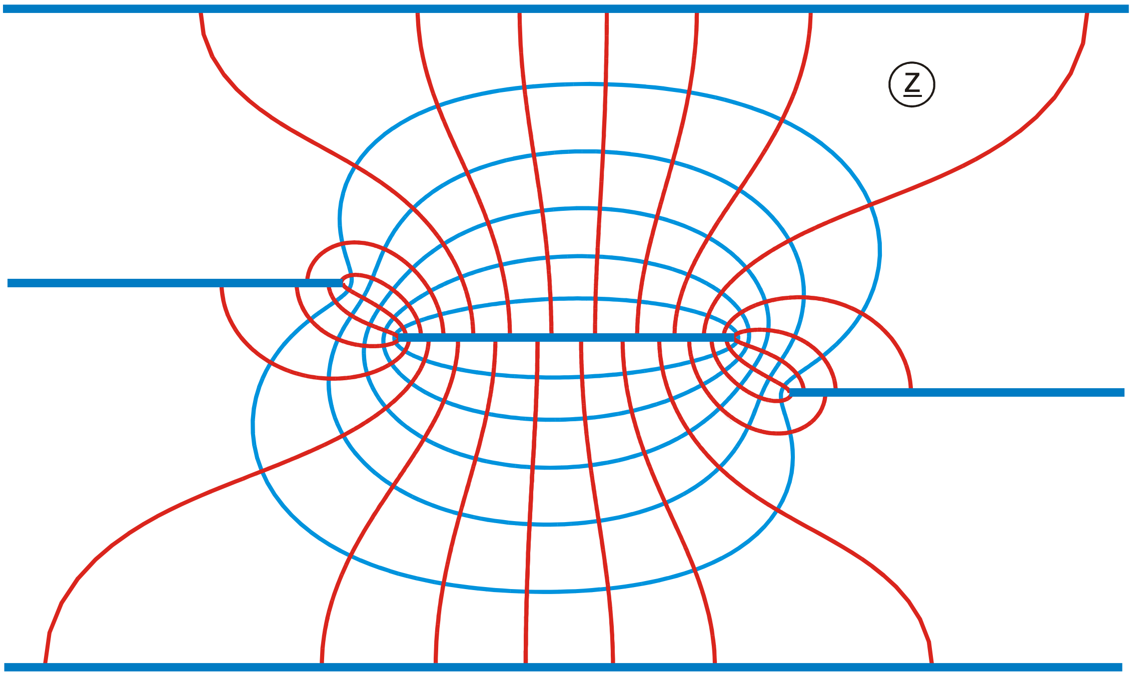
$$z = \ln\left\{a - 1 - a\frac{k + \sigma\,\mathrm{sn}(w,k)}{\sigma + k\,\mathrm{sn}(w,k)}\right\}$$

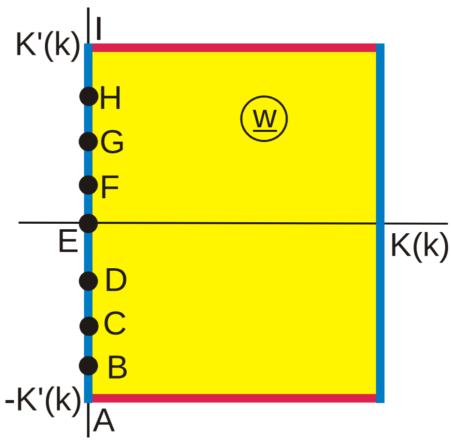
$$a = \frac{\exp(b) + 1}{2} \qquad a_1 = \frac{\exp(c) + 1 - a}{a}$$

$$a_2 = \frac{\exp(d) + 1 - a}{a} \qquad \sigma = k\frac{k - a_1}{1 - ka_1}$$

$$k = \frac{1 - a_1 a_2}{a_1 - a_2} - \sqrt{\left(\frac{1 - a_1 a_2}{a_1 - a_2}\right)^2 - 1}$$

$-K(k) \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$





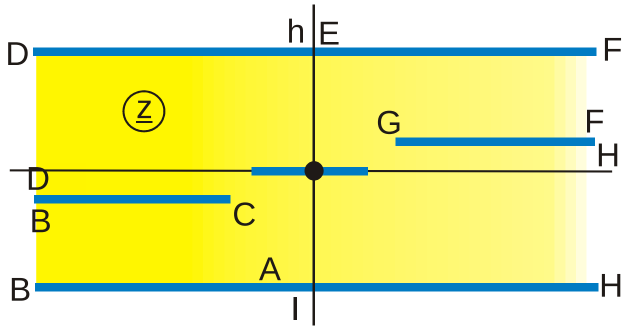


Abbildung H 9.1

$$z = \ln \mathrm{sn}(w + j\sigma, k) - \lambda \ln \mathrm{sn}(w - j\sigma, k)$$

$$h = \frac{\pi}{2}(1 + \lambda)$$

$0 \leq u \leq K(k)$ $-K'(k) \leq v \leq K'(k)$

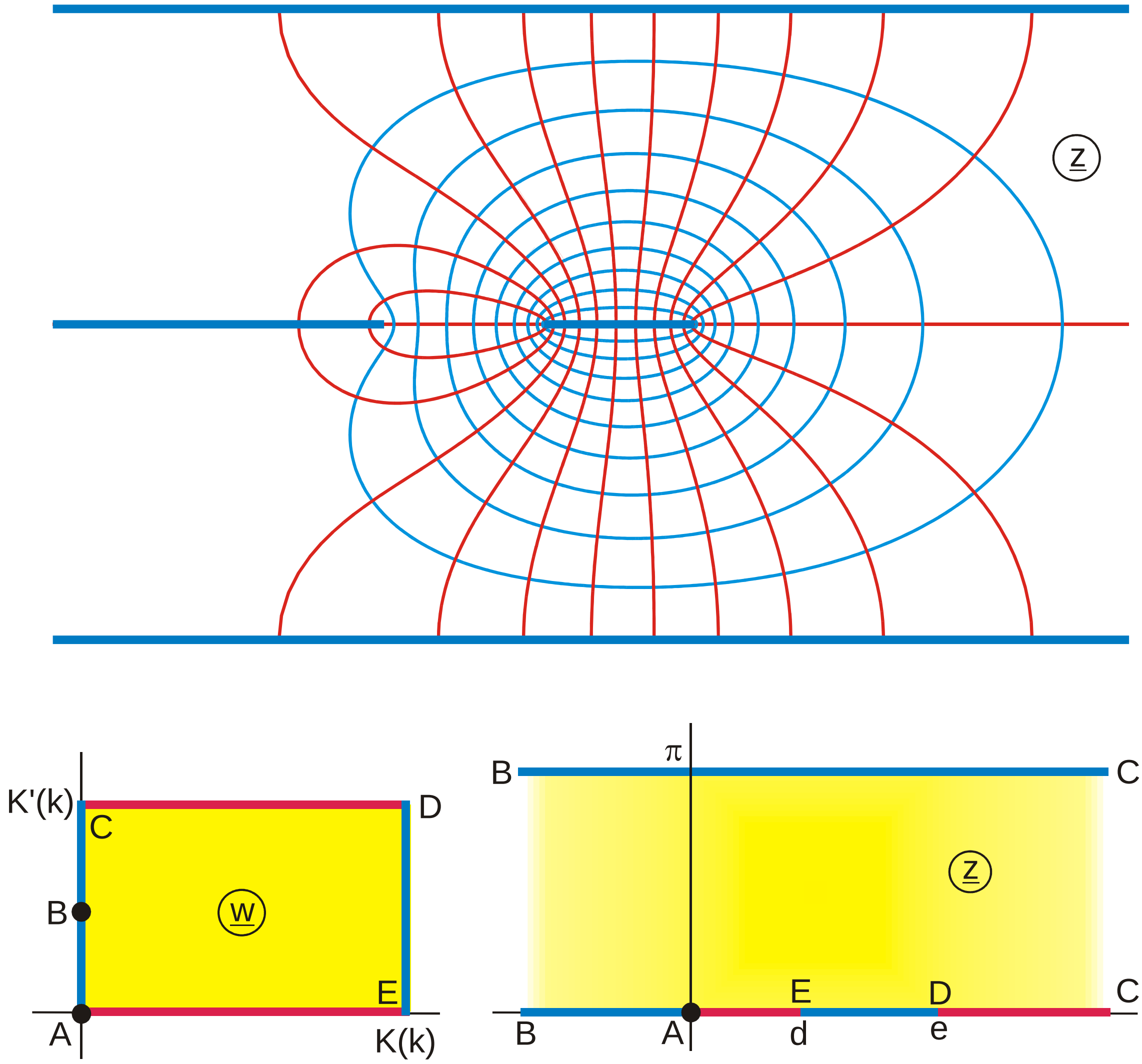


Abbildung H 9.2

$$z = \ln w_1$$

$$w_1 = a\,\mathrm{sn}^2(w,k) + 1 \qquad k = \sqrt{\frac{a}{\exp(e) - 1}}$$

gegeben: d, e

a = exp(d)-1

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

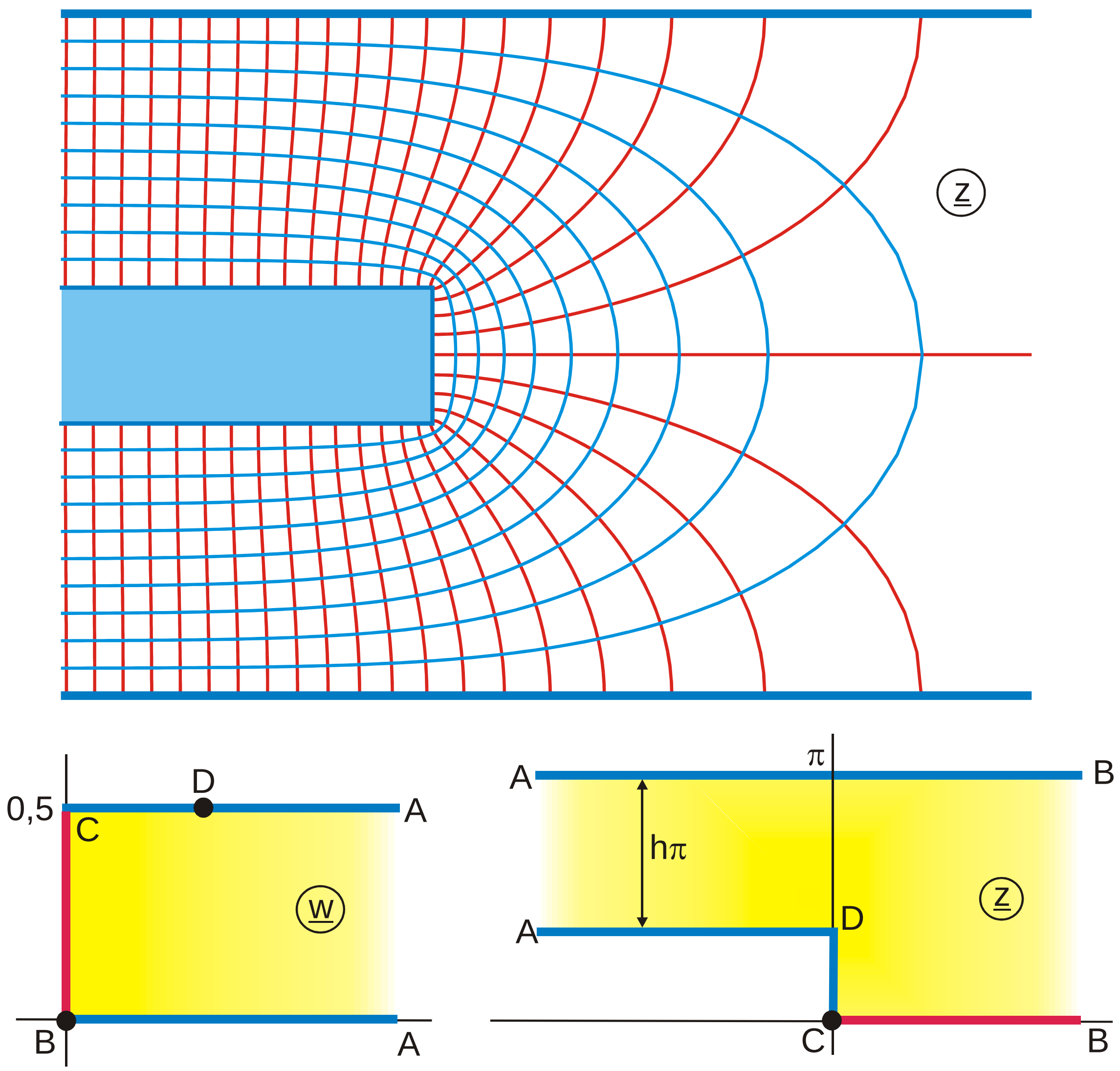


Abbildung H 10

$$z = \operatorname{ar\,cosh}\frac{2w_1 + 1 + h^2}{h^2 - 1} - h\,\operatorname{ar\,cosh}\frac{w_1\left(1+h^2\right)+2h^2}{w_1\left(1-h^2\right)}$$

$$w_1 = \frac{1}{\sinh^2(w\pi)}$$

$$u_D = \frac{1}{\pi}\operatorname{ar\,tanh}\sqrt{1-h^2}$$

$0 \le u \le 1{,}25$

$0 \le v \le 0{,}5$

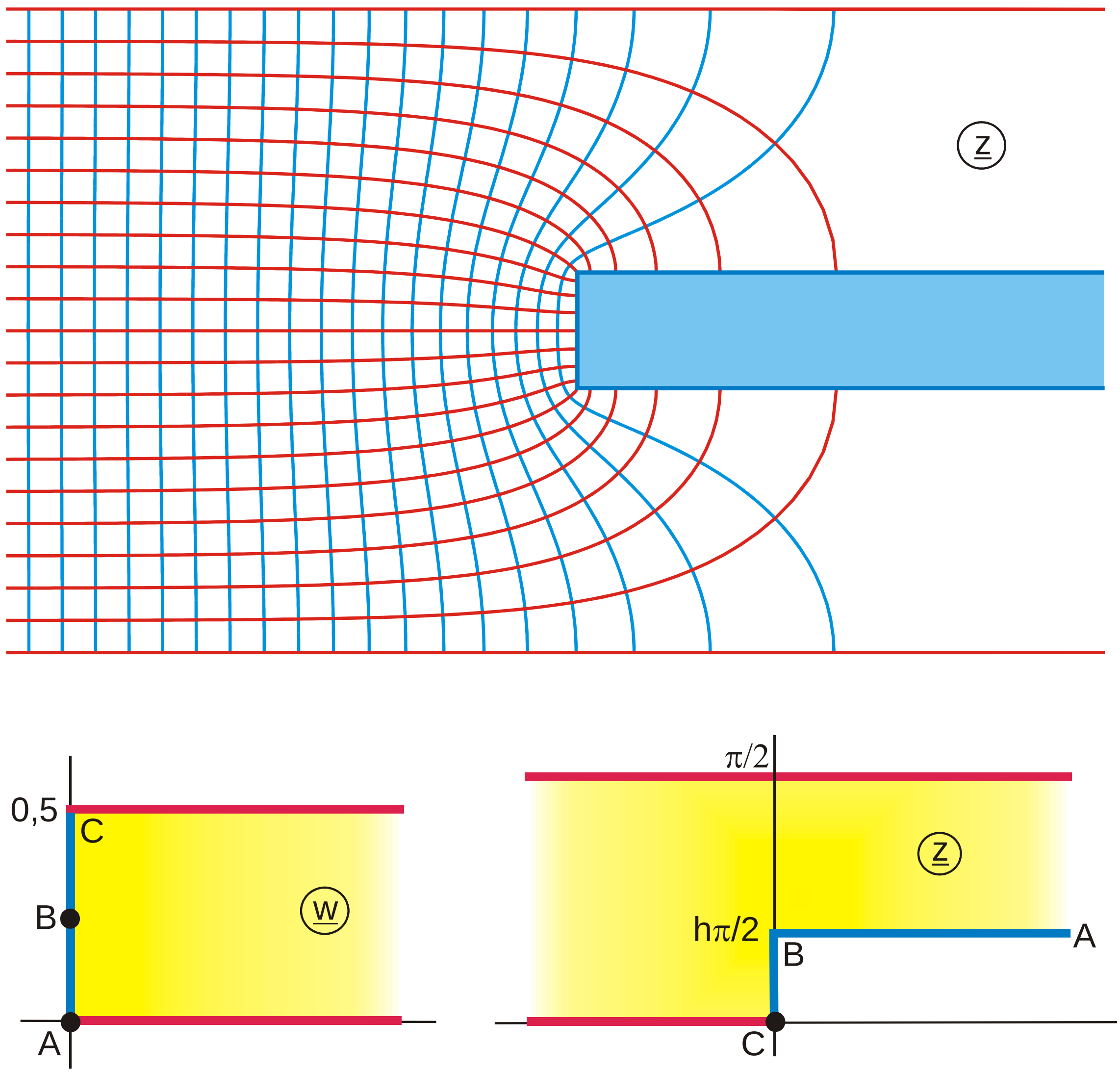


Abbildung H 10.1

$$z = j\frac{\pi}{2} - ar\cosh\frac{w_1}{a} - b\,ar\cosh\frac{cw_1^{\,2} - a^2}{a^2\left(w_1^{\,2} - 1\right)}$$

$$a = \sqrt{2h - h^2} \qquad b = \frac{1}{2}\sqrt{1 - a^2}$$

$$c = 2 - a^2$$

$$w_1 = \cosh(w\pi) \qquad v_B = \frac{1}{\pi}\arccos a$$

$$0 \le u \le 1 \qquad 0 \le v \le 0{,}5$$

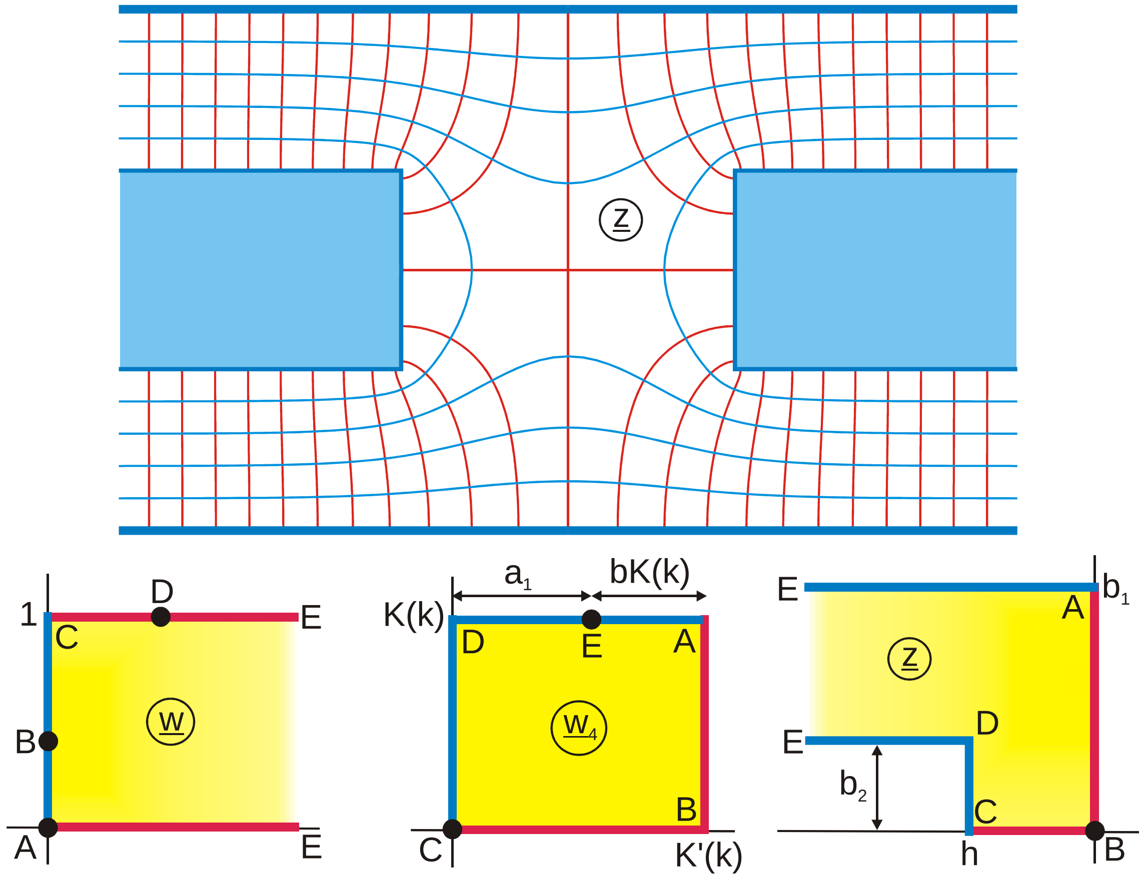


Abbildung H 10.2

$$z = \Pi_e\left(w_4, k', a_1\right) - h \qquad w_4 = K'(k) + j\left\{F_a\left(w_3, k\right) + K(k)\right\}$$

$$w_3 = \frac{w_2 + 1/w_2}{2k} \qquad w_1 = \frac{1 + a\exp(w\pi)}{a + \exp(w\pi)}$$

$$w_2 = -j\sqrt{w_1}$$

$$\text{gegeben}: \tau = K'(k)/K(k)\,,\, d \qquad h = K(k)\left\{1 + c\, Z_e(a_1, k')\right\}$$

$$b_1 = c\left\{K(k)\, Z_e(a_1, k') + \frac{\pi a_1}{2K'(k)}\right\} + K(k) \qquad d = \operatorname{Im} \operatorname{sn}\left\{jbK(k), k\right\}$$

$$b_2 = c\left\{K(k)\, Z_e(a_1, k') + \frac{\pi a_1}{2K'(k)} - \frac{\pi}{2}\right\} + K(k) \qquad u_D = -\frac{1}{\pi}\ln a$$

$$a_1 = K'(k) - b\, K(k) \qquad k = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2$$

$$a = \left\{dk - \sqrt{1 + (dk)^2}\right\}^2 \qquad c = \frac{\operatorname{sn}(a_1, k')}{\operatorname{cn}(a_1, k')\, \operatorname{dn}(a_1, k')}$$

$0 \le u \le 3$ $\qquad$ $0 \le v \le 1$

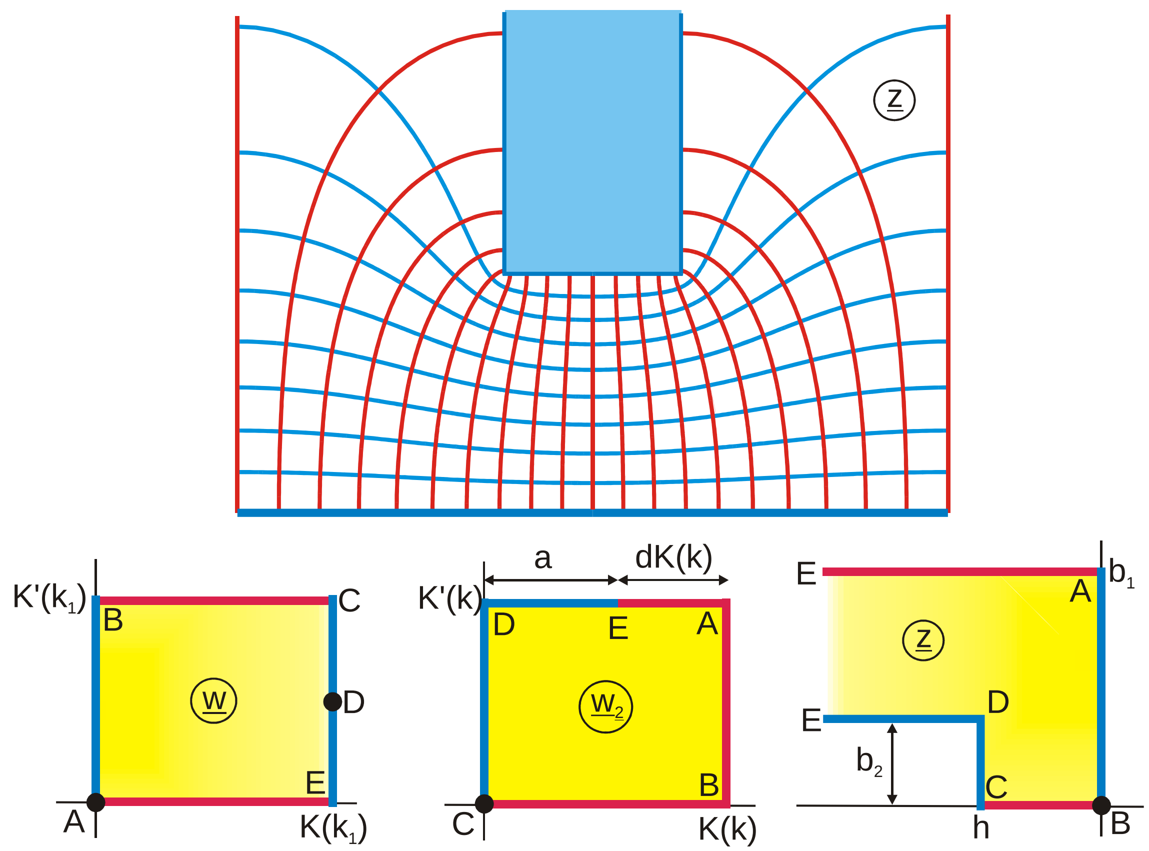


Abbildung H 10.3

$$z = \Pi_e\left(w_2, k, a_1\right) - h$$

$$w_2 = K(k) + jK'(k) - F_a\left(w_1, k\right)$$

$$w_1 = \frac{k_1}{k}\,\mathrm{sn}(w, k_1)$$

gegeben : $\tau = K'(k)/K(k)$, d

$$h = K(k)\left\{1 + b\, Z_e(a,k)\right\}$$

$$b_1 = b\left\{K'(k)\, Z_e(a,k) + \frac{\pi a}{2K(k)}\right\} + K'(k)$$

$$v_D = \mathrm{Im}\, F_a\left(\frac{k}{k_1}, k_1\right)$$

$$b_2 = b\left\{K'(k)\, Z_e(a,k) + \frac{\pi a}{2K(k)} - \frac{\pi}{2}\right\} + K'(k)$$

$$a = (1-d)\, K(k)$$

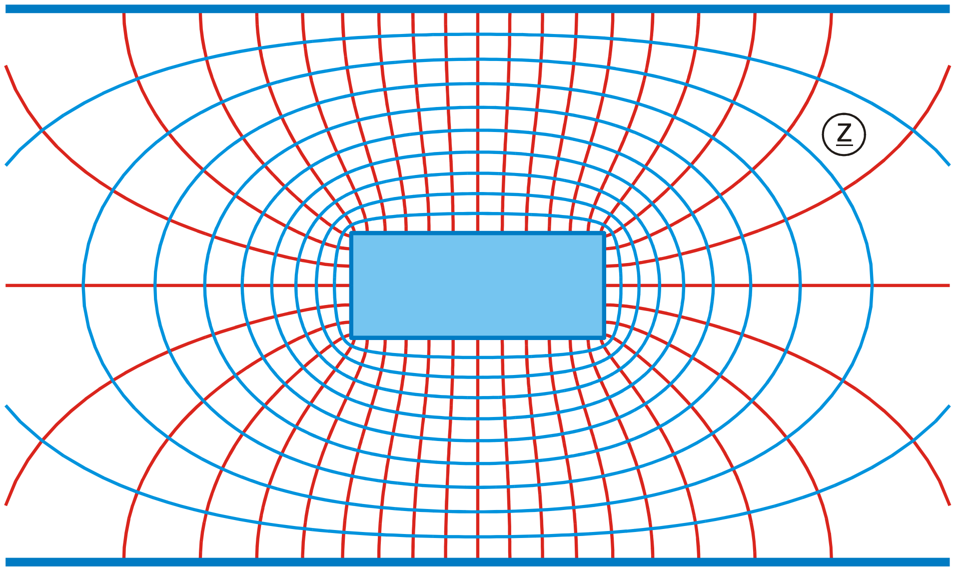
$$k = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2$$

$$k_1 = k\,\mathrm{sn}\left\{d\; K(k), k\right\}$$

$$b = \frac{\mathrm{sn}(a,k)}{c\,\mathrm{n}(a,k)\;\mathrm{dn}(a,k)}$$

$0 \le u \le K(k_1)$

$0 \le v \le K'(k_1)$



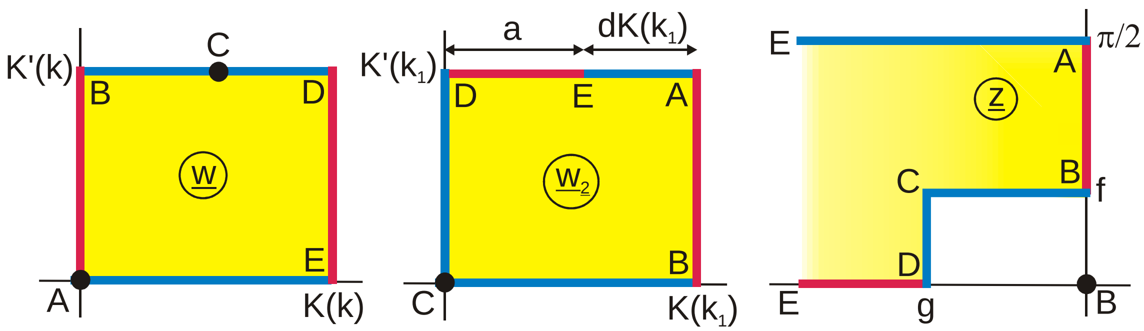


Abbildung H 11

$$z = \Pi_j\left(w_2, k_1, a\right) - g + jf$$

$$w_2 = K(k_1) + jK'(k_1) - F_a\left(w_1, k_1\right) \qquad w_1 = k\,\mathrm{sn}(w,k)$$

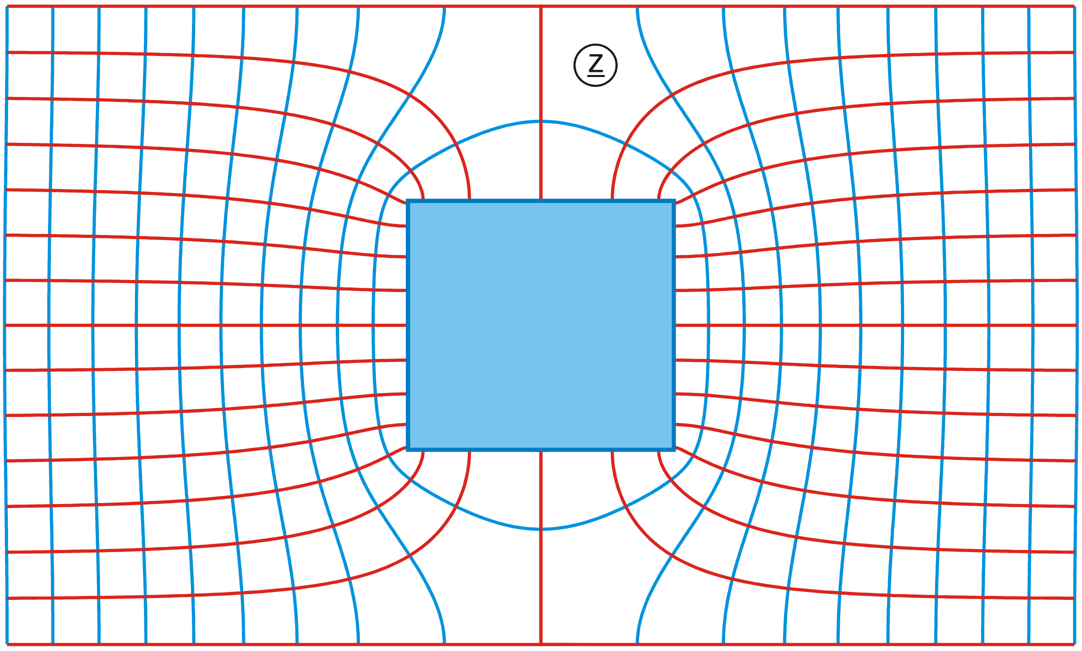
gegeben : $\tau = K'(k_1)/K(k_1)$, d

$$f = \frac{\pi}{2} - K'(k_1)\, Z_e(a,k_1) - \frac{\pi a}{2K(k_1)} \qquad a = K(k_1)(1 - d)$$

$$u_C = \mathrm{Re}\, F_a\left(\frac{1}{kk_1}, k\right) \qquad g = K(k_1)\, Z_e(a,k_1)$$

$$k_1 = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2 \qquad k = \mathrm{sn}\left\{d\; K(k_1), k_1\right\}$$

$$0 \le u \le K(k) \qquad 0 \le v \le K'(k)$$



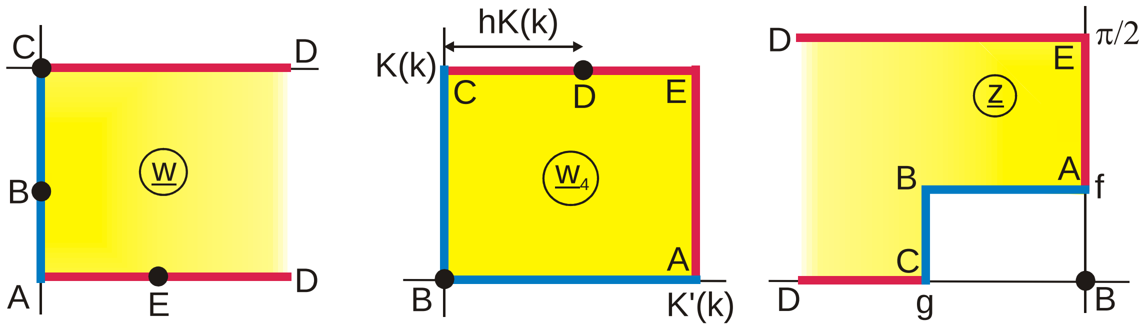


Abbildung H 11.1

$$z = \Pi_j\left(w_4, k', hK(k)\right) - g + jf$$

$$w_4 = j\left\{-F_a\left(w_3, k\right) + K(k)\right\} \qquad w_3 = \frac{w_2 + 1/w_2}{2k}$$

$$w_1 = \frac{1 + a\exp(w\pi)}{a + \exp(w\pi)} \qquad w_2 = -j\sqrt{w_1}$$

gegeben : $\tau = K'(k)/K(k)$, d

$$f = \frac{\pi}{2} - K(k)\, Z_e(hK(k), k') - \frac{\pi h}{2\tau} \qquad d = \text{Im sn}\{jhK(k), k\}$$

$$u_E = -\frac{1}{\pi}\ln a \qquad g = K'(k)\, Z_e\{hK(k), k'\}$$

$$k = \left\{\vartheta_2(0,\tau)/\vartheta_3(0,\tau)\right\}^2 \qquad a = \left(dk - \sqrt{1 - (dk)^2}\right)^2$$

$0 \le u \le 1{,}368$ $\qquad$ $-1 \le v \le 0$

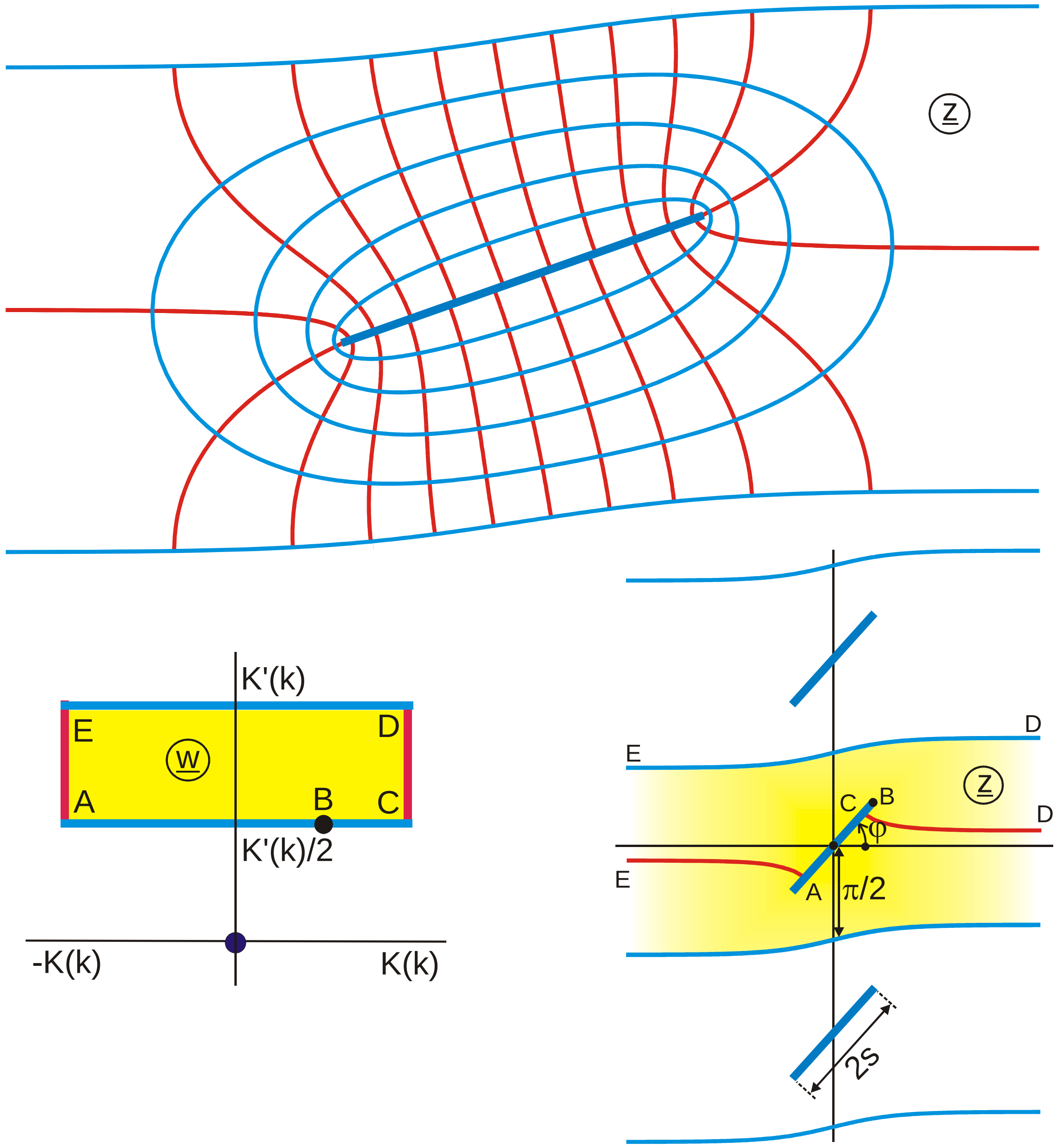


Abbildung H 12

$$z = \exp(j2\varphi)\,\operatorname{ar\,tanh}\frac{1}{w_1} + \operatorname{ar\,tanh}\frac{1}{kw_1} + j\frac{\pi}{2}$$

$$w_1 = \operatorname{sn}(w,k)$$

$$w_B = F_a\left(\sqrt{\frac{k+\exp(j2\varphi)}{1+k\exp(j2\varphi)}}\Big/\sqrt{k}\,,k\right)$$

$$s = \left|z\left(w_B\right)\right|$$

$-K(k) \le u \le K(k)$

$K'(k)/2 \le v \le K'(k)$

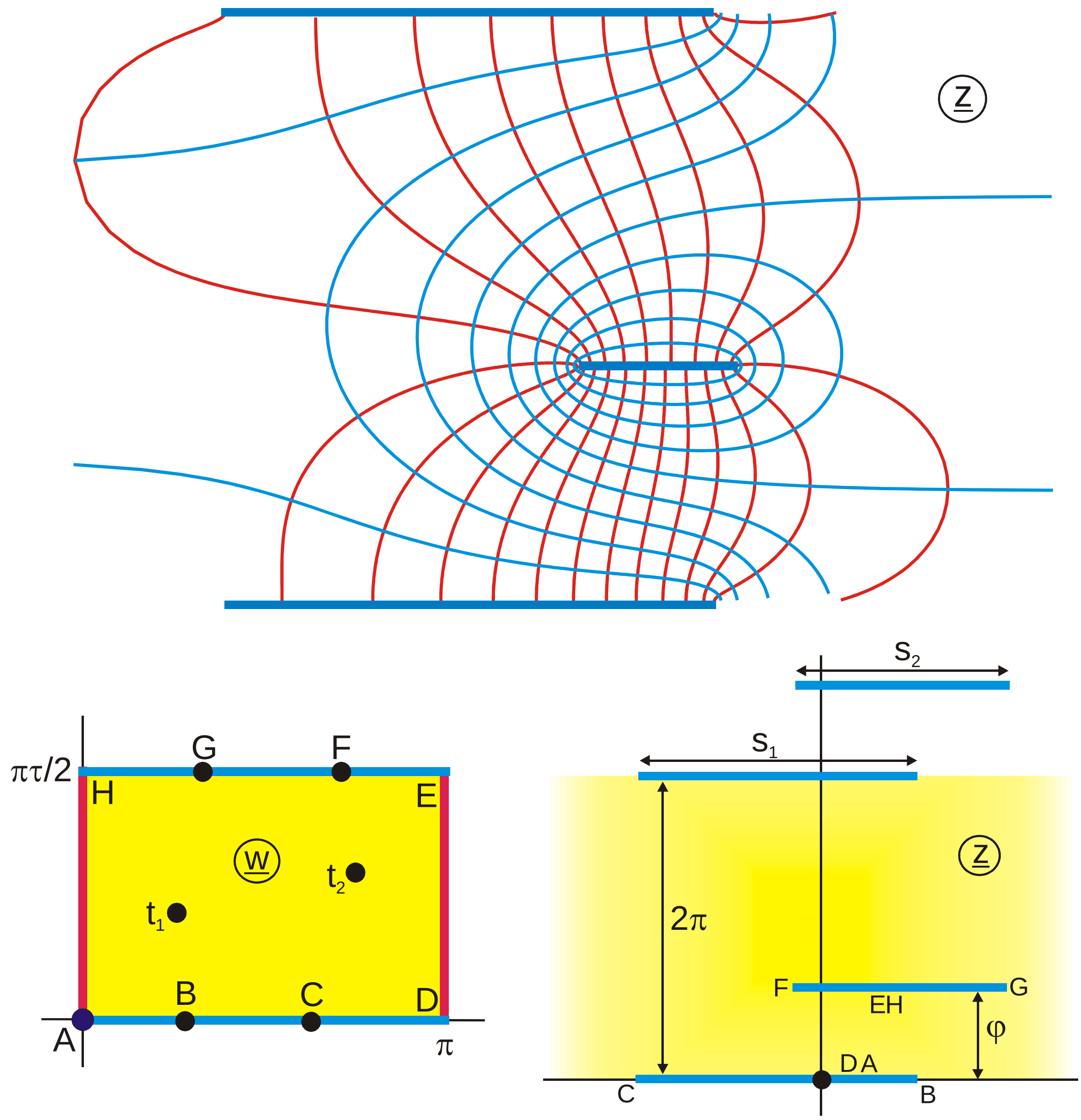


Abbildung H 12.1

$$z = \ln \frac{\vartheta_1\left[\left(w - t_1\right), \tau\right] \vartheta_1\left[\left(w - t_1^*\right), \tau\right]}{\vartheta_1\left[\left(w - t_2\right), \tau\right] \vartheta_1\left[\left(w - t_2^*\right), \tau\right]}$$

gegeben: t_1, t_2, τ $\qquad$ $\varphi = 2\pi\left(\operatorname{Re} t_1 - \operatorname{Re} t_2\right)$

$0 \le u \le \pi$ $\qquad$ $0 \le v \le \pi\tau/2$

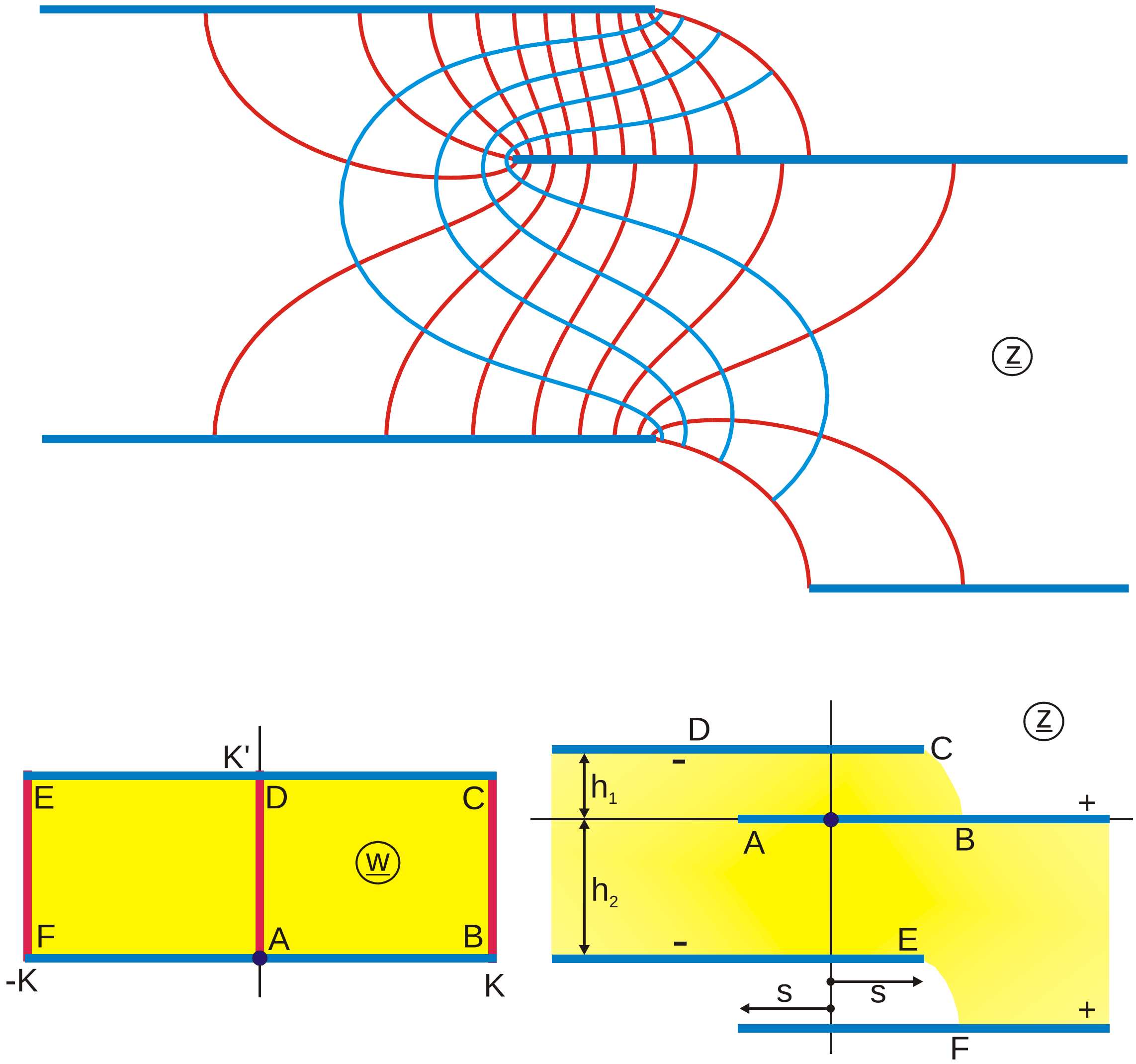


Abbildung H 12.2

$$z = \ln \vartheta_4\left[\frac{\pi}{2K(k)}(w+a),\tau\right] - \ln \vartheta_2\left[\frac{\pi}{2K(k)}(w-a),\tau\right]$$

$a = \dfrac{b\,K(k)}{\pi}$ $\qquad$ $\tau = \dfrac{K'(k)}{K(k)}$

gegeben: b, k

$s = 0$ und $h_1 = 0$ für $b = \pi/2$ $\qquad$ $h_1 = h_2$ für $b = 0$

$s = 0$ für $k = 1/\mathrm{sqr}(2)$

$-K(k) \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)$

$b = 0{,}15\pi$ $\qquad$ $k = 0{,}95$

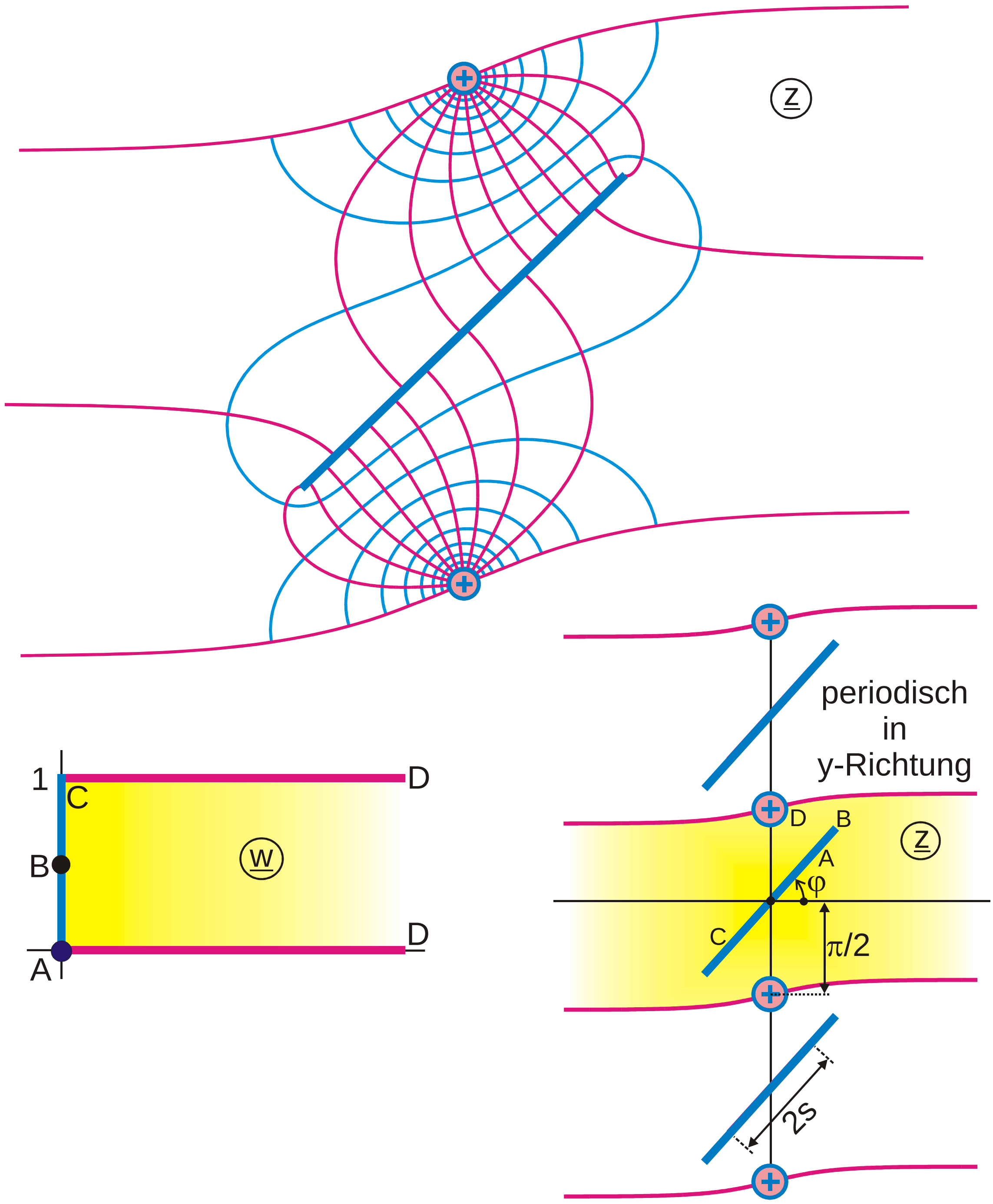


Abbildung H 12.3

$$z = \exp(j2\varphi)\,\mathrm{ar\,tanh}\frac{p}{w_1} + \mathrm{ar\,tanh}\frac{1}{p w_1} + j\frac{\pi}{2} \qquad w_1 = \exp(\pi w)$$

gegeben: p, φ

$0 \le u \le 0{,}9$ $\qquad$ $0 \le v \le 1$

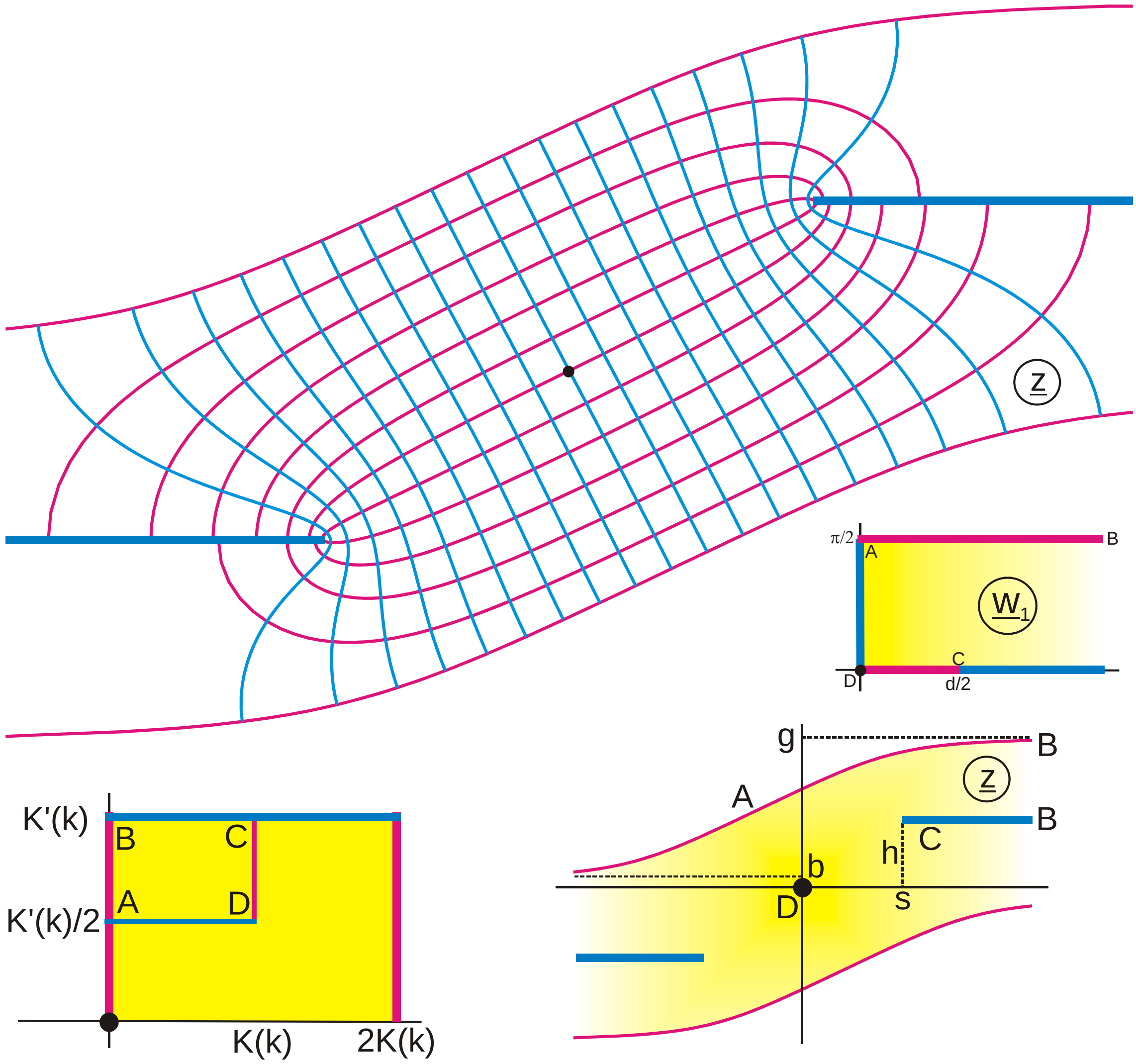


Abbildung H 12.4

$$z = aw + w_1 - a\left\{K(k) + jK'(K)/2\right\}$$

$$w_1 = \ln \mathrm{sn}(w,k) - d/2$$

gegeben: a, d

k = exp(-d)

$$h = \frac{aK'(k)}{2}$$

$$g = \frac{aK'(k) + \pi}{2}$$

$$b = \frac{aK'(k) - \pi}{2}$$

$0 \le u \le 2K(k)$

$0 \le v \le K'(k)$

Abbildungen Gruppe I

Doppelt periodische Feldbilder

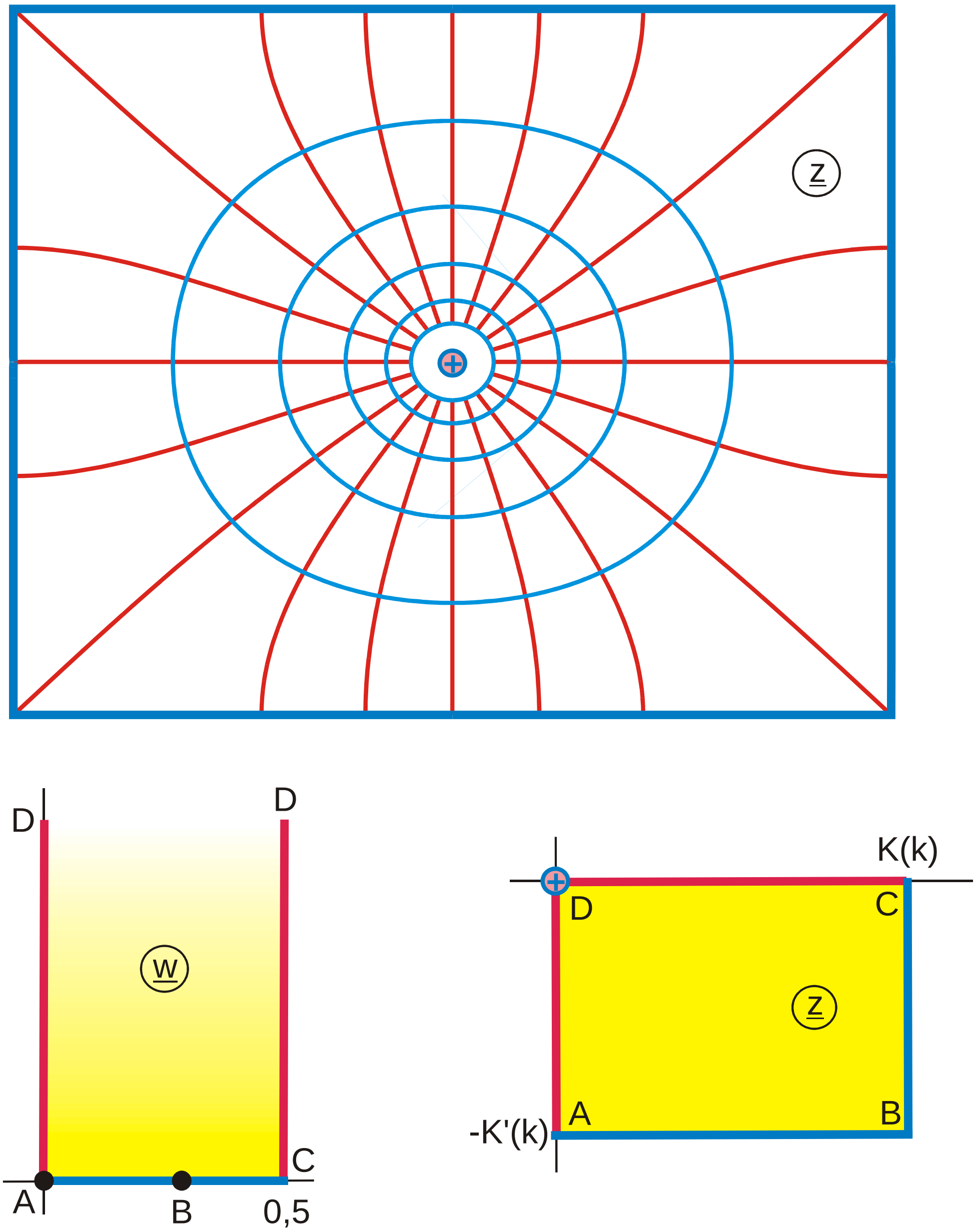
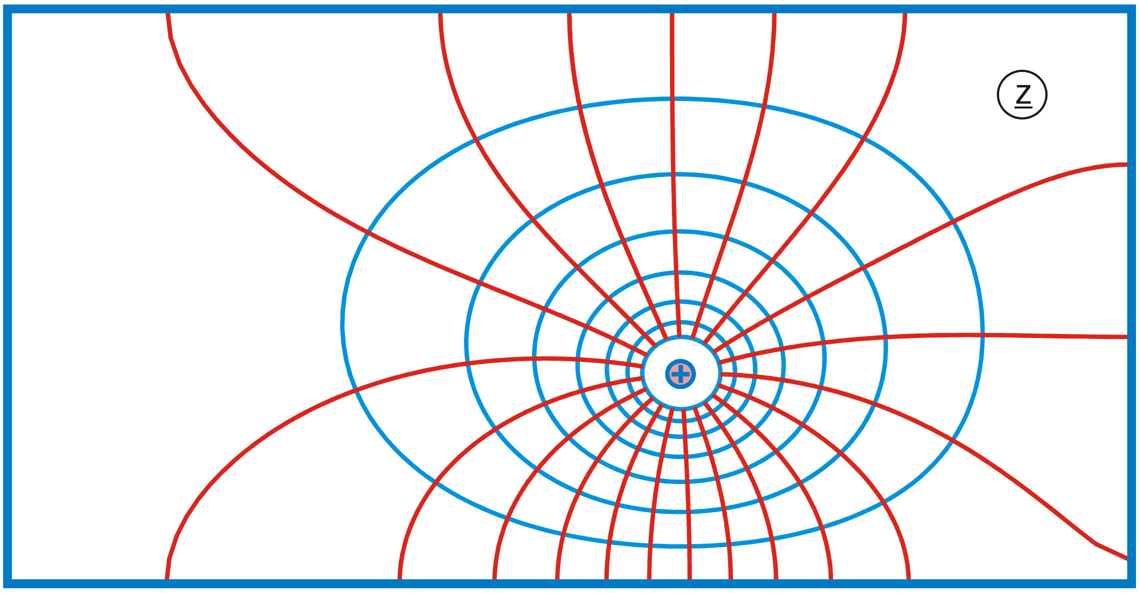


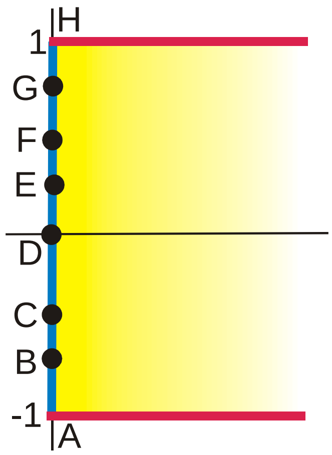
Abbildung I 1

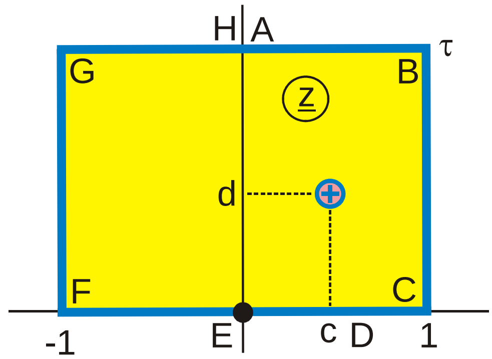
$$z = F_a\left[\frac{\sin(w\pi)}{k}, k\right] - jK'(k)$$

$$u_B = \frac{1}{\pi}\arcsin k$$

$$0 \le u \le 0,5$$







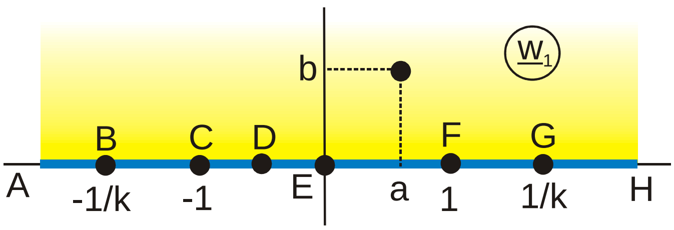


Abbildung I 1.1

$$z = \frac{F_a(w_1, k)}{K(k)}$$

$$w_1 = a + jb\tanh(w\pi/2)$$

$$u_C = \mathrm{Re}\, F_a\left(\frac{1}{ak}, k\right)$$

$$k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$a + jb = \mathrm{sn}\left[(c + jd)K(k), k\right]$$

$$v_B = \frac{2}{\pi}\arctan\frac{a - 1/k}{b}$$

$$v_C = \frac{2}{\pi}\arctan\frac{a - 1}{b}$$

$$v_E = \frac{2}{\pi}\arctan\frac{a}{b}$$

$$v_F = \frac{2}{\pi}\arctan\frac{a + 1}{b}$$

$$v_G = \frac{2}{\pi}\arctan\frac{a + 1/k}{b}$$

$0 \le u \le 0{,}7$

$-1 \le v \le 1$

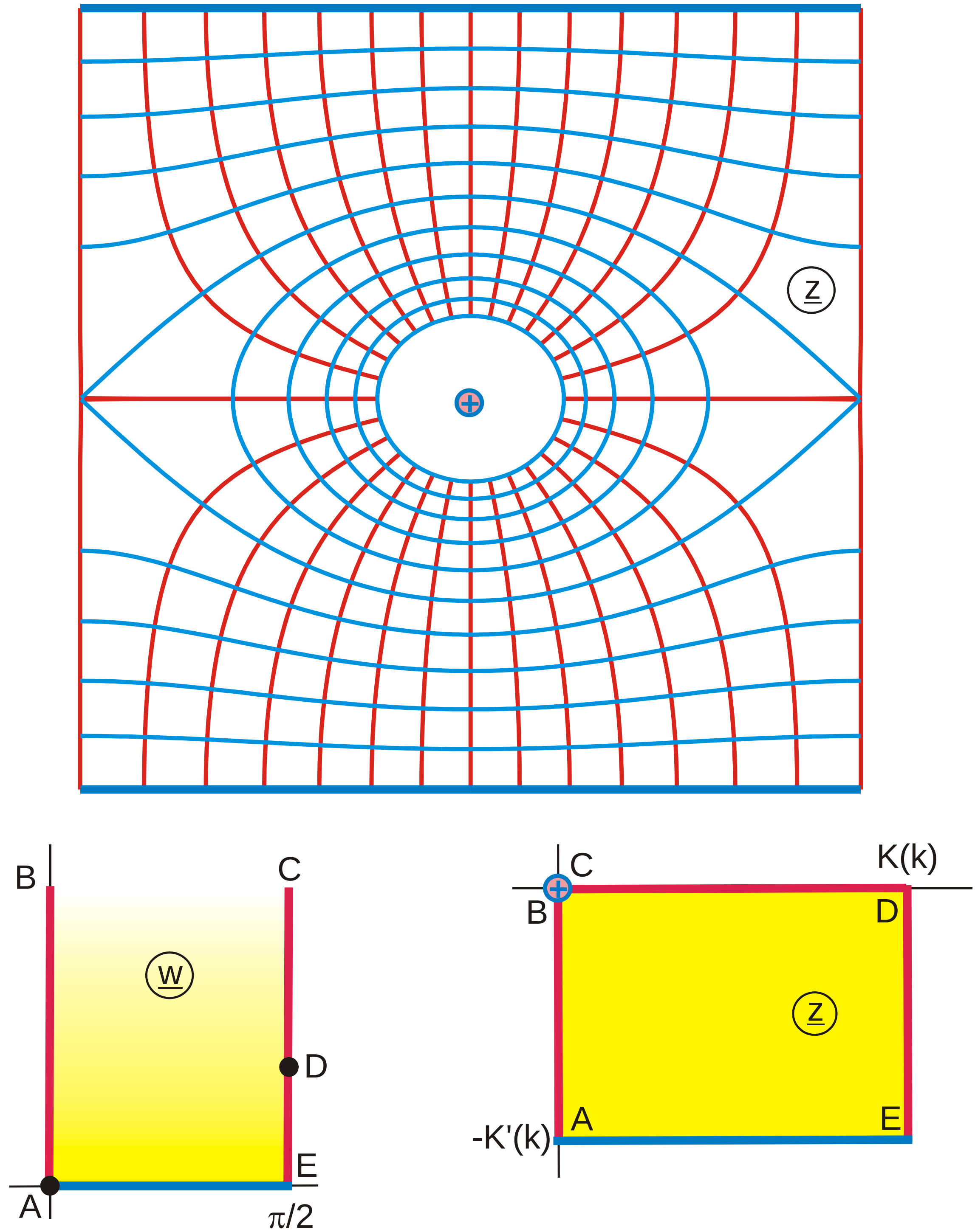


Abbildung I 1.2

$$z = F_t(w,k) - jK'(k)$$

$$v_D = \operatorname{ar\,cosh}\frac{1}{k}$$

$0 \le u \le \pi/2$ $\qquad$ $0 \le v \le 2$

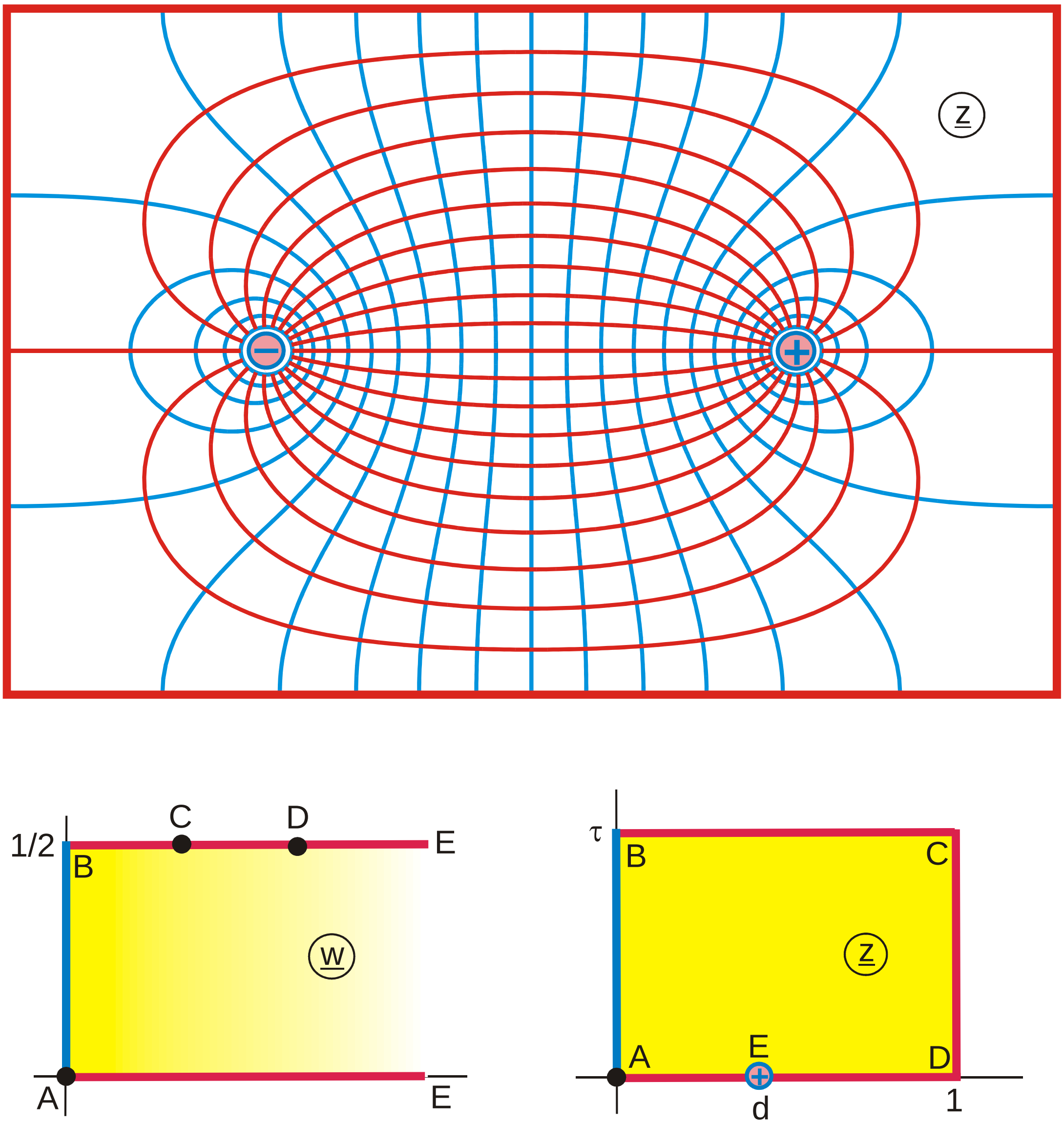


Abbildung I 1.3

$$z = \frac{F_a(w_1, k)}{K(k)}$$

$$w_1 = a\tanh(w\pi)$$

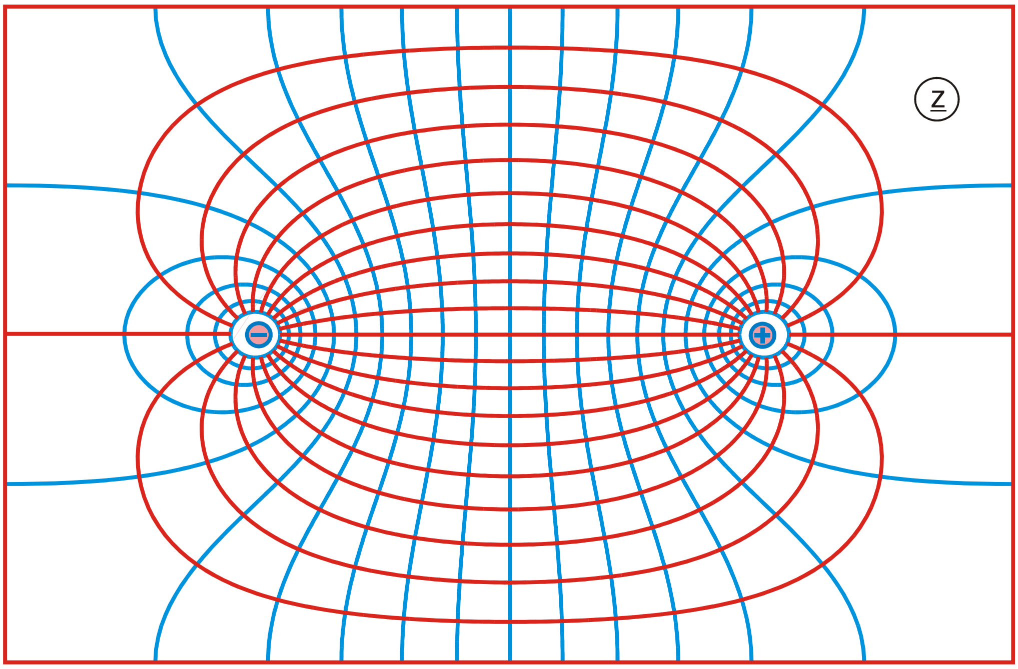
$$\mathrm{k} = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$\mathrm{a} = \mathrm{sn}\left[\mathrm{dK(k), k}\right]$$

$$u_D = \frac{1}{\pi} ar\tanh a$$

$$u_C = \frac{1}{\pi} ar\tanh(ak)$$

$$0 \le \mathrm{v} \le 1/2$$



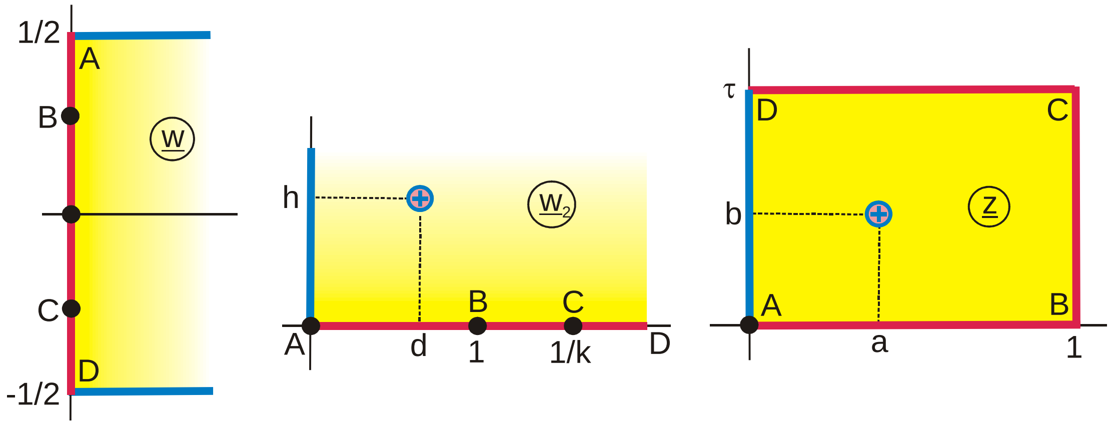


Abbildung I 1.4

$$z = \frac{F_a(w_2, k)}{K(k)}$$

$$w_2 = jhw_1 \pm j\sqrt{h^2(w_1^2 - 1) - d^2} \qquad w_1 = \tanh(w\pi)$$

$$\mathrm{k} = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2 \qquad \mathrm{d} + \mathrm{jh} = \mathrm{sn}\left[(\mathrm{a} + \mathrm{jb})\mathrm{K}(\mathrm{k}), \mathrm{k}\right]$$

$$v_C = \frac{1}{\pi}\arctan\left[\frac{k}{2h}\left(h^2 + d^2 - \frac{1}{k^2}\right)\right] \qquad v_B = \frac{1}{\pi}\arctan\left[\frac{h^2 + d^2 - 1}{2h}\right]$$

$-0{,}5 \le \mathrm{v} \le 0{,}5$

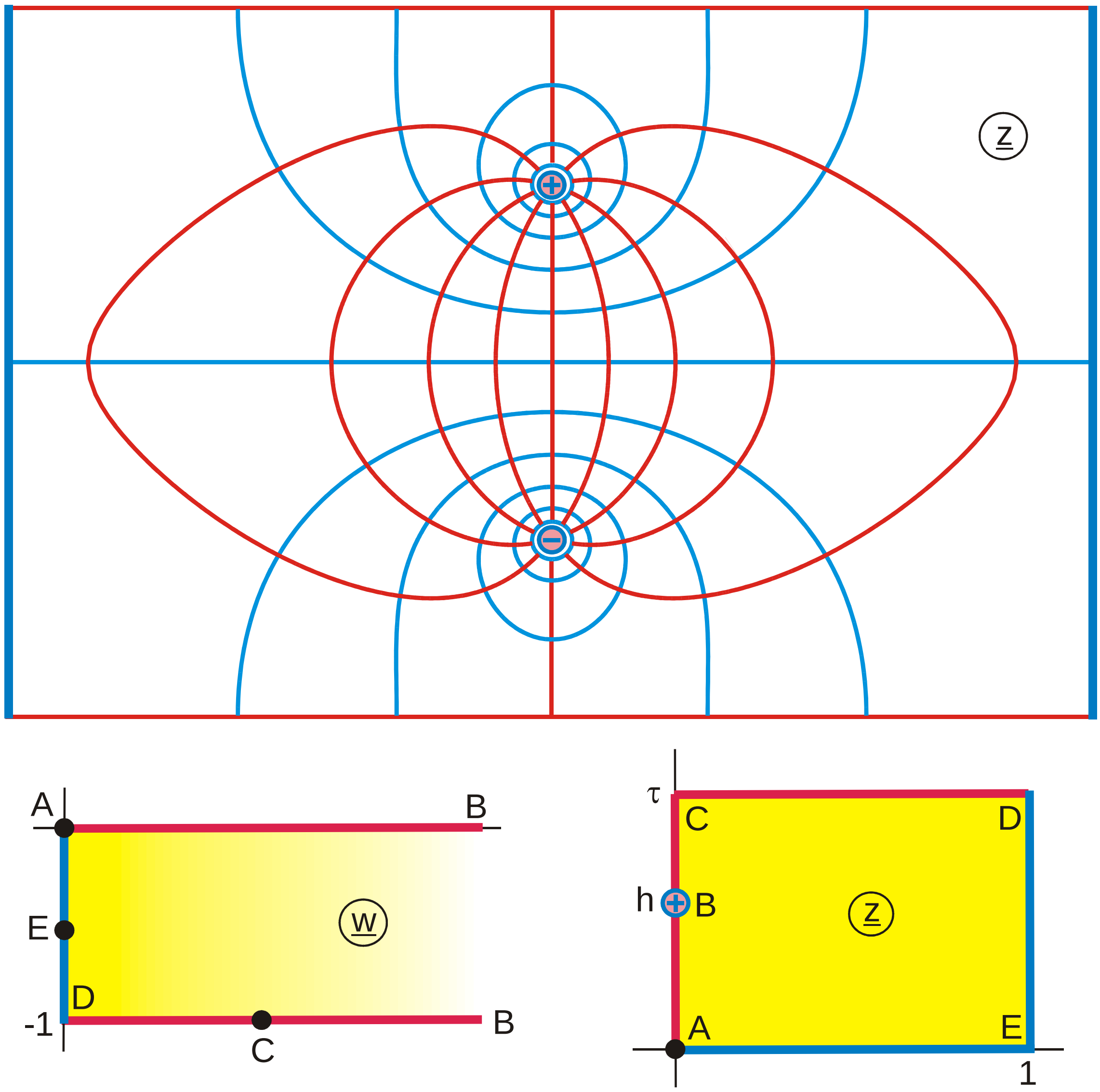


Abbildung I 1.5

$$z = \frac{F_a(w_3,k)}{K(k)}$$

$$w_3 = \frac{w_2 + 1/w_2}{2k}$$

$$w_2 = -j\sqrt{w_1}$$

$$w_1 = \frac{1 + a\exp(w\pi)}{a + \exp(w\pi)}$$

$$\mathrm{k} = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$\mathrm{d} = \mathrm{Im\,sn}\left[\mathrm{jh\ K(k), k}\right]$$

$$h = \frac{F_a(d,k)}{K(k)}$$

$$a = \left[dk - \sqrt{1+(dk)^2}\right]^2$$

$$u^C = -\frac{1}{\pi}\ln a$$

$0 \leq \mathrm{u} \leq 1$

$-1 \leq \mathrm{v} \leq 0$

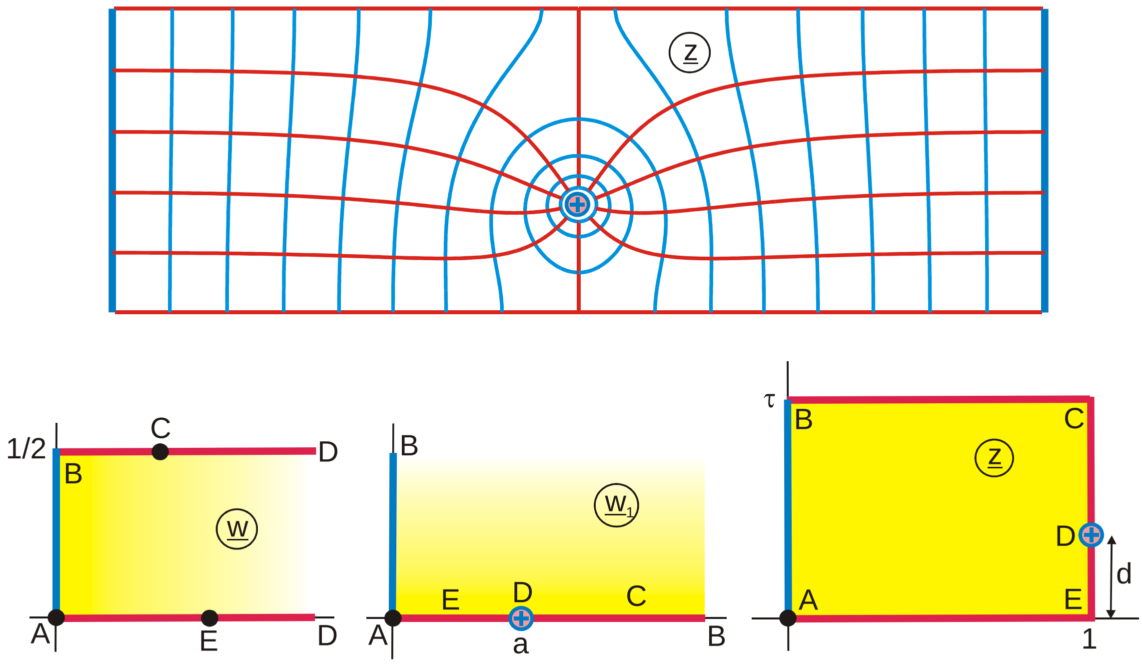


Abbildung I 1.6

$$z = \frac{F_a(w_1,k)}{K(k)}$$

$$w_1 = a\tanh(w\pi)$$

$$\mathrm{k} = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$\mathrm{a} = \mathrm{Re\,sn}\left[\mathrm{K(k)} + \mathrm{jd\,K(k),k}\right]$$

$$u_E = \frac{1}{\pi} ar\tanh\frac{1}{a} \qquad u_C = \frac{1}{\pi} ar\tanh(ak)$$

$0 \le \mathrm{v} \le 1/2$

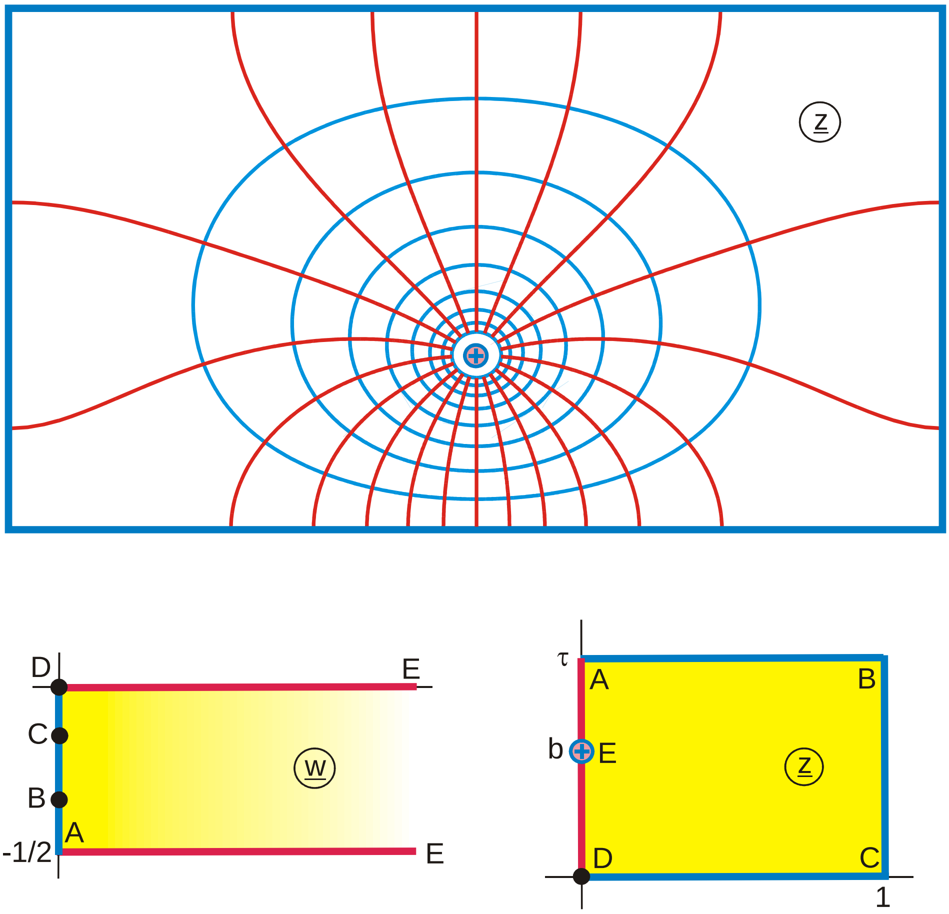


Abbildung I 1.7

$$z = \frac{F_a(w_1, k)}{K(k)}$$

$$w_1 = jh\tanh(w\pi)$$

$$\mathrm{k} = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2 \qquad \mathrm{h} = \mathrm{Im\,sn}\left[\mathrm{jb\;K(k),k}\right]$$

$$v_B = -\frac{1}{\pi}\arctan\frac{1}{hk} \qquad v_C = -\frac{1}{\pi}\arctan\frac{1}{h}$$

$$-0{,}5 \le \mathrm{v} \le 0 \qquad 0 \le \mathrm{u} \le 0{,}5$$

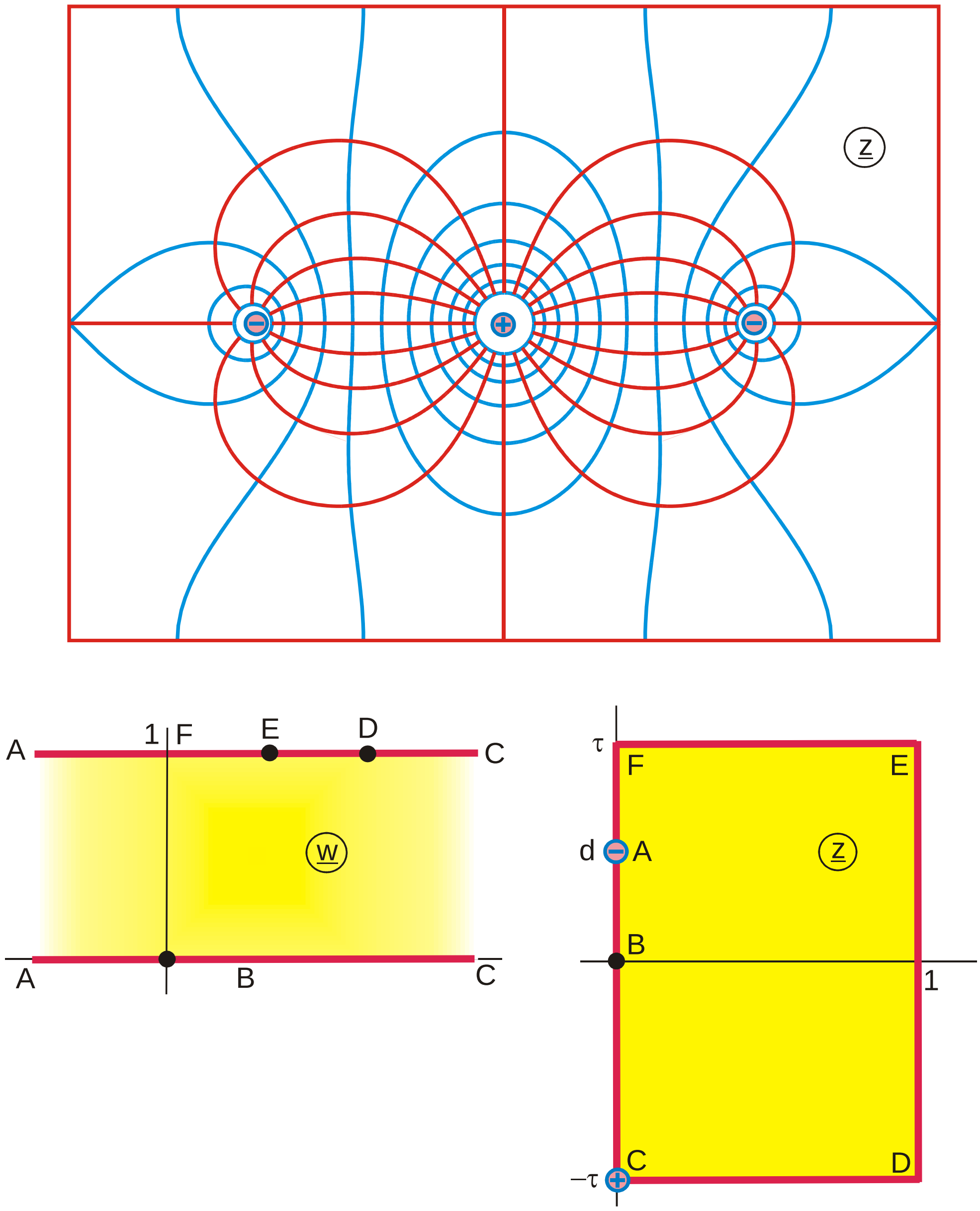


Abbildung I 1.8

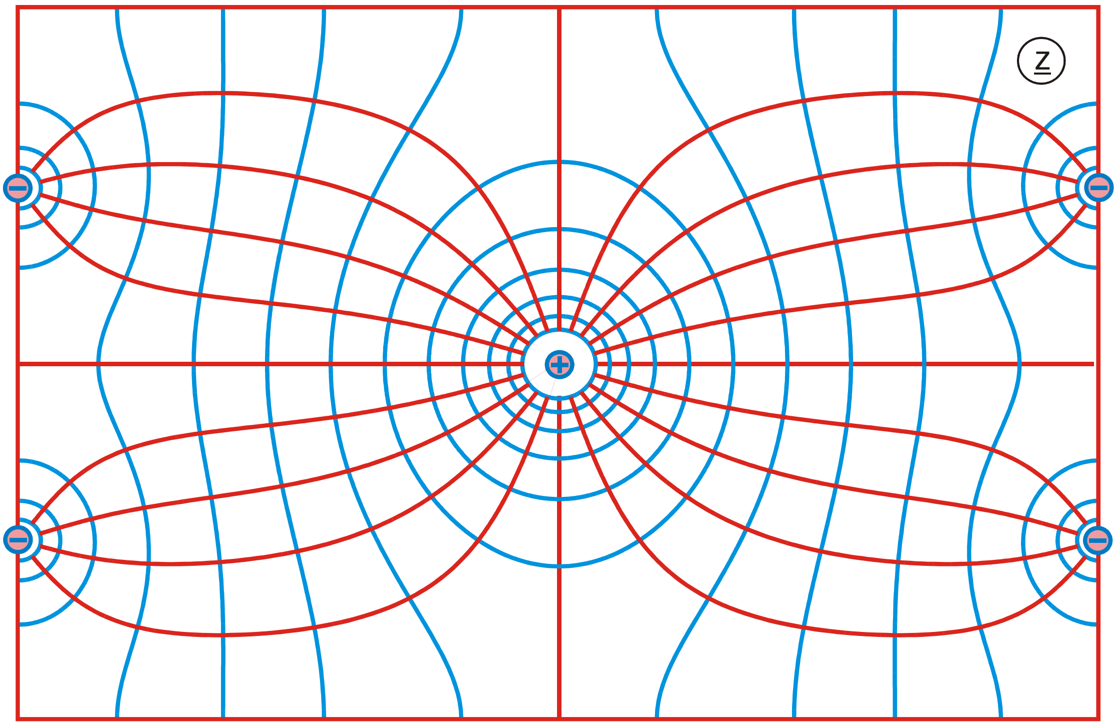
$$z = \frac{F_t(w_1,k)}{K(k)}$$

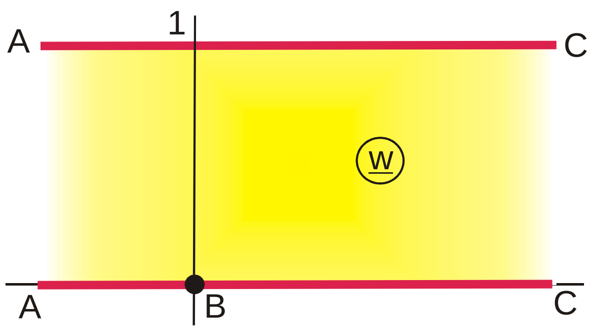
$$w_1 = -j\frac{\ln[1+\exp(w\pi)]}{2-a}$$

gegeben: τ, b mit |b| < τ

$$a = \operatorname{ar\,sinh}\,\operatorname{sn}[jb\,K(k),k]$$

$0 \le v \le 1$ $\qquad$ $-0{,}5 \le u \le 1{,}5$





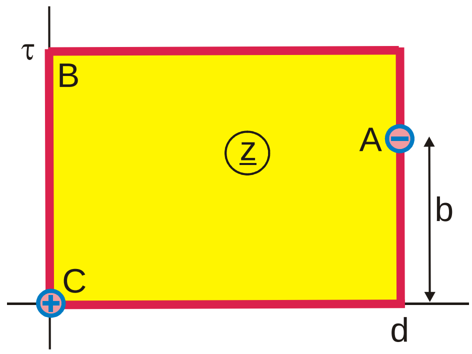


Abbildung I 1.9

$$z = \frac{F_a(w_1, k)}{K(k)}$$

$$w_1 = \frac{a}{\sqrt{1 - \exp(w\pi)}}$$

gegeben: τ, d, b mit d, b auf dem Rand

$$a = \mathrm{sn}\left[(d + jb)\,K(k), k\right]$$

$0 \le v \le 1$ $-0{,}5 \le u \le 1{,}5$

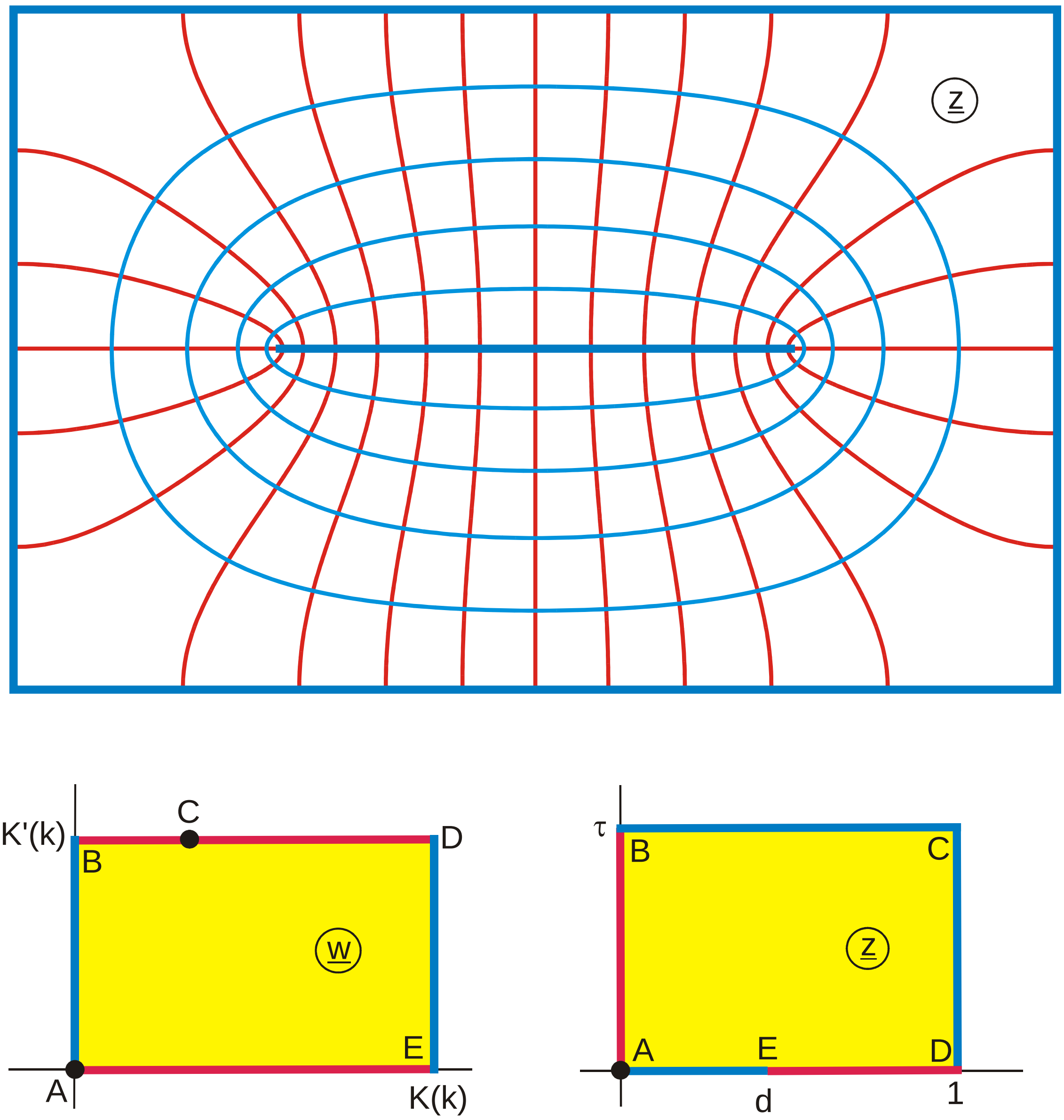


Abbildung I 2

$$z = \frac{F_a(w_1, k_1)}{K(k_1)}$$

$$w_1 = k \,\mathrm{sn}(w, k)$$

$$\mathrm{k}_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2 \qquad \mathrm{k} = \mathrm{sn}\left[\mathrm{d}\ \mathrm{K}(\mathrm{k}_1), \mathrm{k}_1\right]$$

$$u_C = \mathrm{Re}\, F_a\left(\frac{1}{k\, k_1}, k\right)$$

$0 \le \mathrm{v} \le \mathrm{K}'(\mathrm{k})$ $\qquad$ $0 \le \mathrm{u} \le \mathrm{K}(\mathrm{k})$

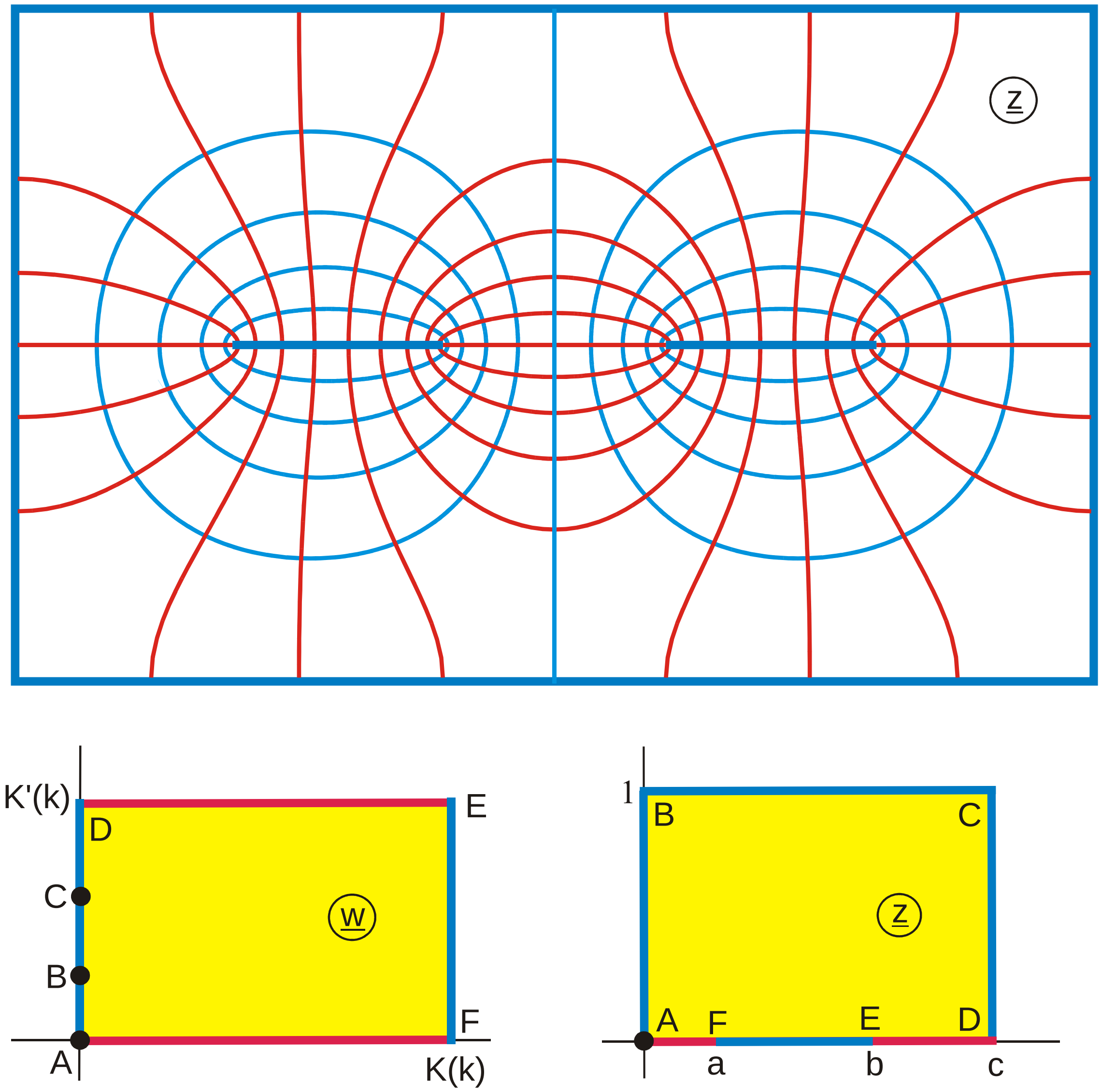


Abbildung I 2.1

$$z = -j\frac{F_a(w_1, k_1)}{K(k_1)}$$

$$w_1 = j\sigma\,\mathrm{sn}(w, k)$$

$$\mathrm{k}_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$v_C = \mathrm{Im}\,F_a\left(\frac{j}{\sigma\, k_1}, k\right)$$

gegeben: a, b, c = τ

$0 \le \mathrm{v} \le \mathrm{K'(k)}$

$$\mathrm{k} = \frac{\sigma}{\mathrm{Im\,sn}\left[\mathrm{jb\ K(k_1), k_1}\right]}$$

$$v_B = \mathrm{Im}\,F_a\left(\frac{j}{\sigma}, k\right)$$

$$\sigma = \mathrm{Im\,sn}\left[ja\ K(k_1), k_1\right]$$

$0 \le \mathrm{u} \le \mathrm{K(k)}$

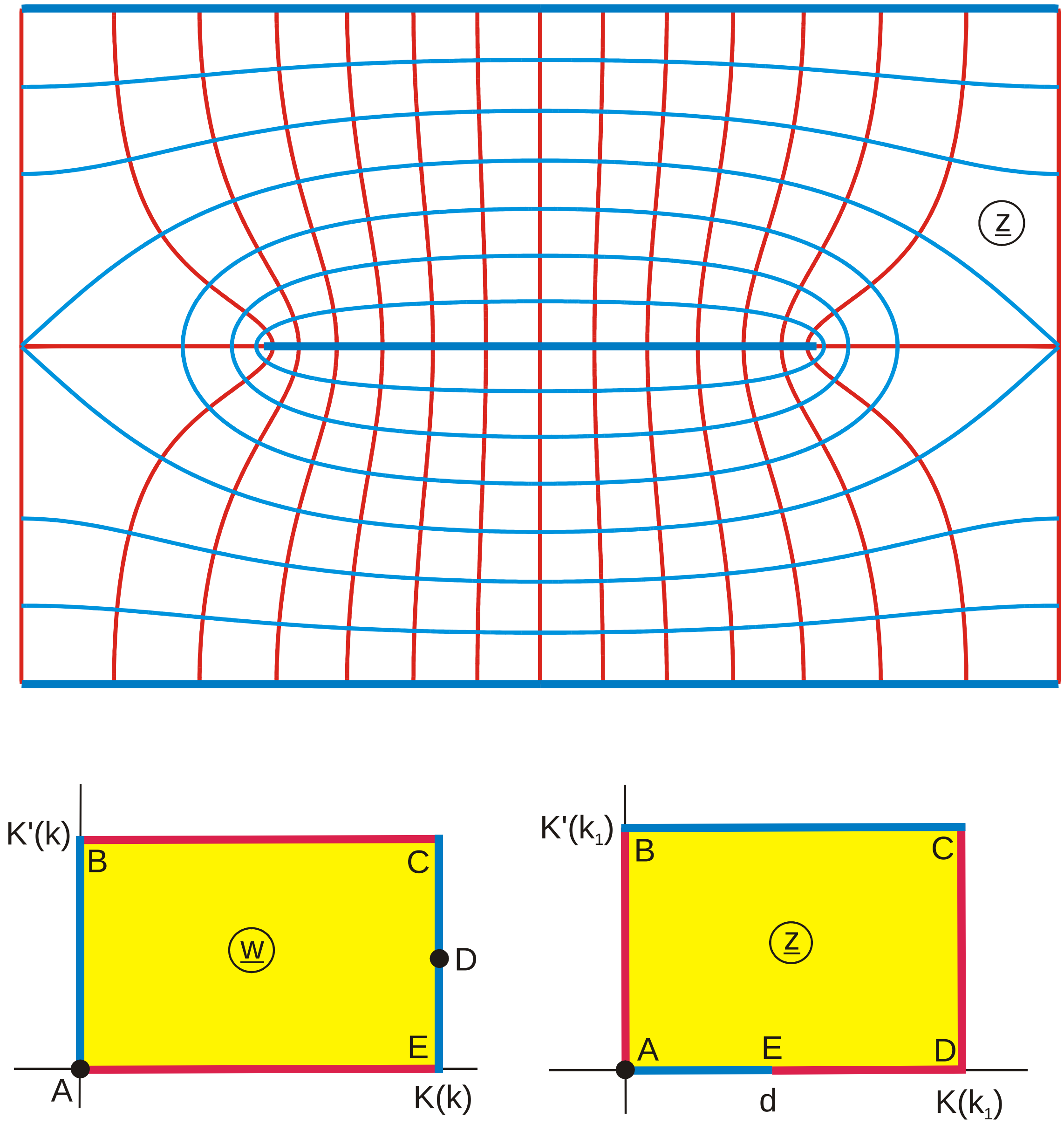


Abbildung I 2.2

$$z = F_a(w_1, k_1)$$

$$w_1 = \frac{k}{k_1}\,\mathrm{sn}(w,k) \qquad \tau = \frac{K'(k_1)}{K(k_1)}$$

$$\mathrm{k}_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2 \qquad \mathrm{k} = \mathrm{k}_1\,\mathrm{sn}(\mathrm{d},\mathrm{k}_1)$$

$$v_D = \operatorname{Im} F_a\left(\frac{k_1}{k}, k\right) \qquad d = F_a\left(\frac{k}{k_1}, k_1\right)$$

$$0 \le \mathrm{v} \le \mathrm{K}'(\mathrm{k}) \qquad 0 \le \mathrm{u} \le \mathrm{K}(\mathrm{k})$$

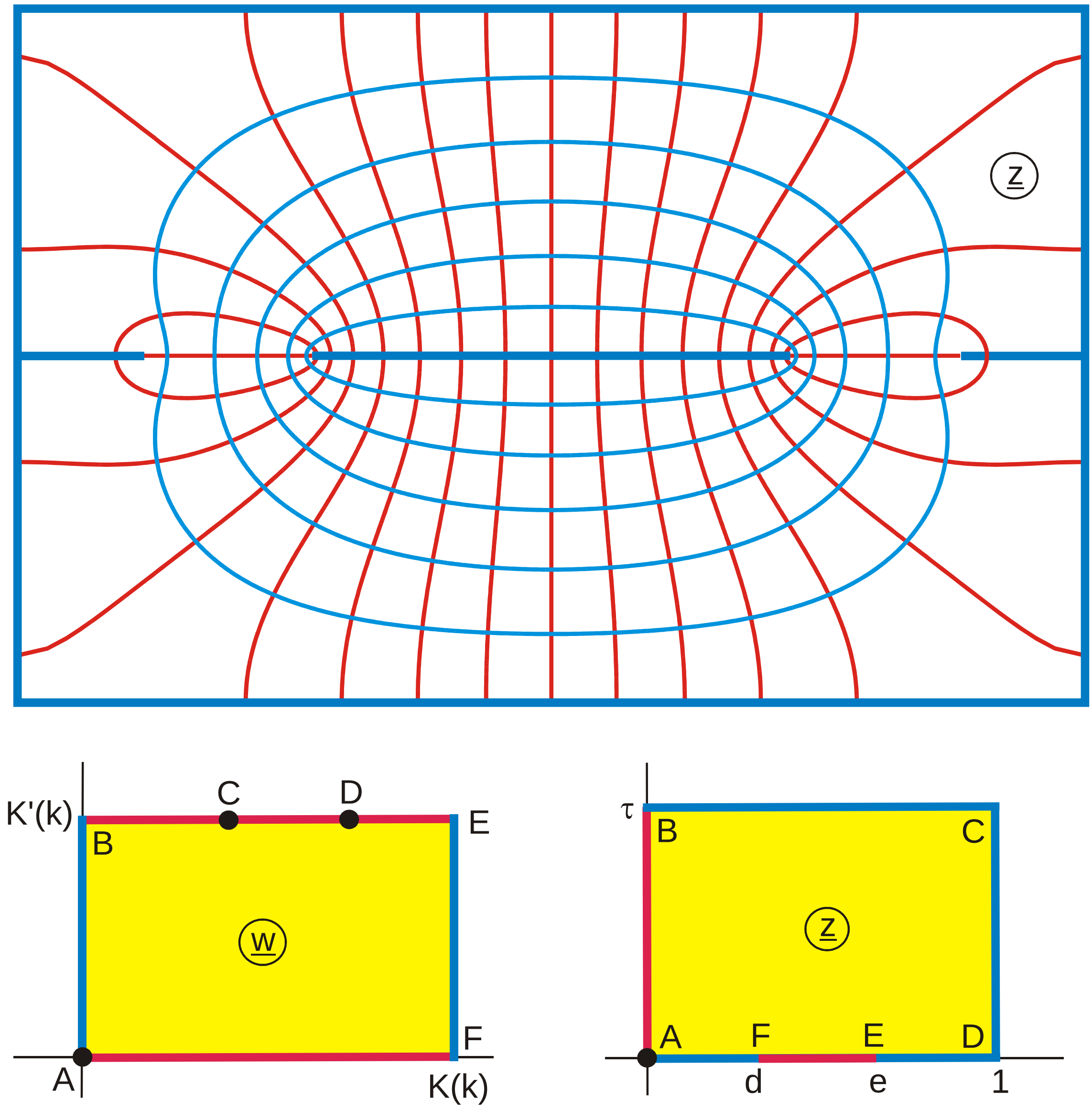


Abbildung I 2.3

$z = F_a(w_1, k_1)/K(k_1)$

$w_1 = ak\,\mathrm{sn}(w,k)$

$$\mathrm{k}_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2 \qquad \mathrm{k} = \frac{1}{\mathrm{a}}\mathrm{sn}\left[\mathrm{d}\ \mathrm{K}(\mathrm{k}_1), \mathrm{k}_1\right]$$

$$u_D = \mathrm{Re}\,F_a\left(\frac{1}{ak}, k\right) \qquad u_C = \mathrm{Re}\,F_a\left(\frac{1}{akk_1}, k\right)$$

$a = \mathrm{sn}\left[e\ K(k_1), k_1\right]$

$0 \le \mathrm{v} \le \mathrm{K}'(\mathrm{k})$ $\qquad 0 \le \mathrm{u} \le \mathrm{K}(\mathrm{k})$

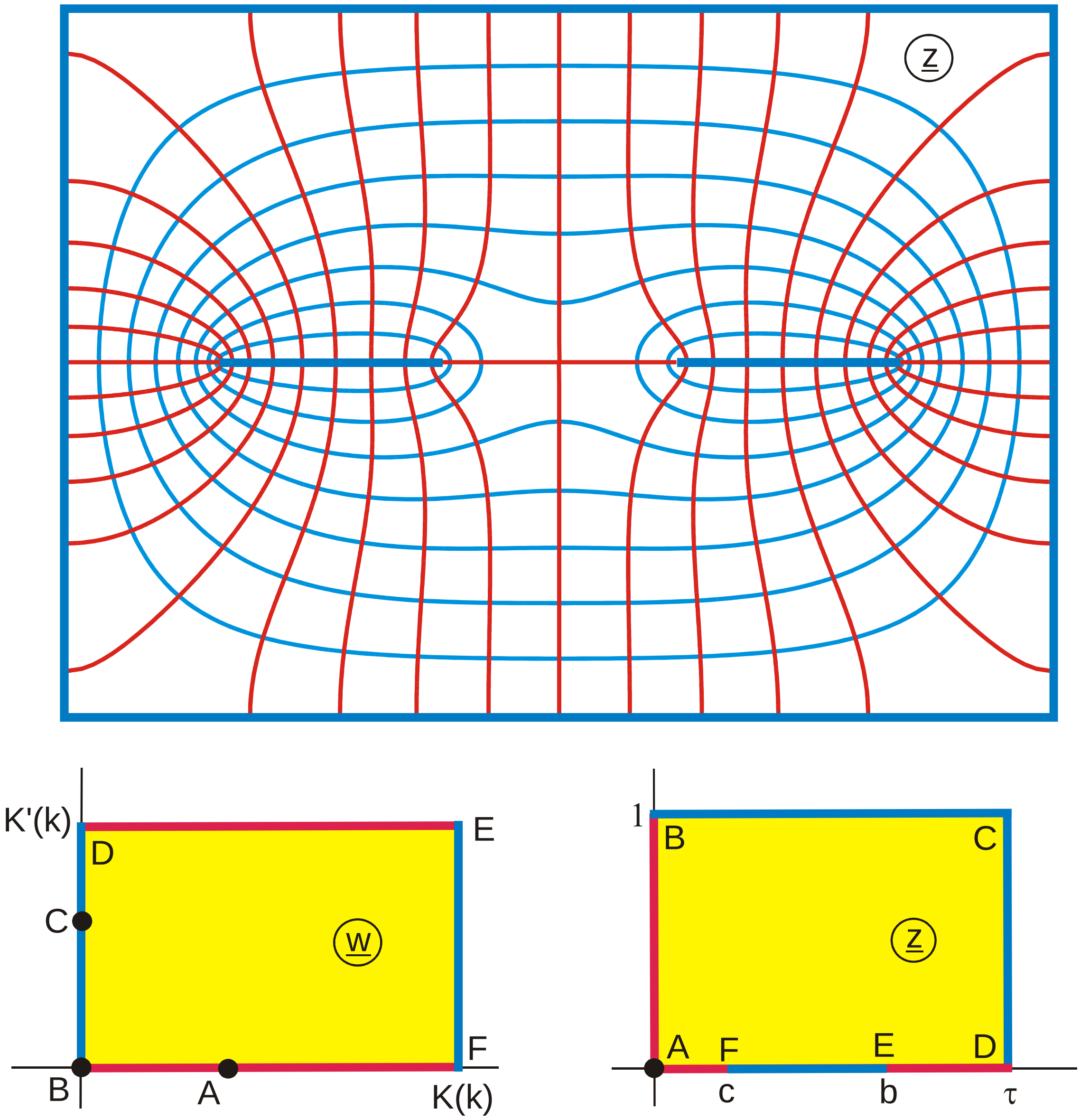


Abbildung I 2.4

$$z = j\,F_t(w_1, k_1)/K(k_1)$$

$$w_1 = \pi/2 - \arcsin\left[a\ \mathrm{sn}(w,k)\right]$$

$$\mathrm{a} = \frac{1}{\sqrt{1-\mathrm{sn}^2\left[\mathrm{c\ K(k_1), k_1'}\right]}} \qquad \mathrm{k} = \mathrm{a}\sqrt{1-\mathrm{sn}^2\left[\mathrm{c\ K(k_1), k_1'}\right]}$$

$$v_C = \mathrm{Im}\,F_a\left(j\frac{\sinh\{ar\cosh(1/k_1)\}}{a}, k\right) \qquad u_A = F_a\left(\frac{1}{a}, k\right)$$

$$0 \le \mathrm{v} \le \mathrm{K'(k)} \qquad 0 \le \mathrm{u} \le \mathrm{K(k)}$$

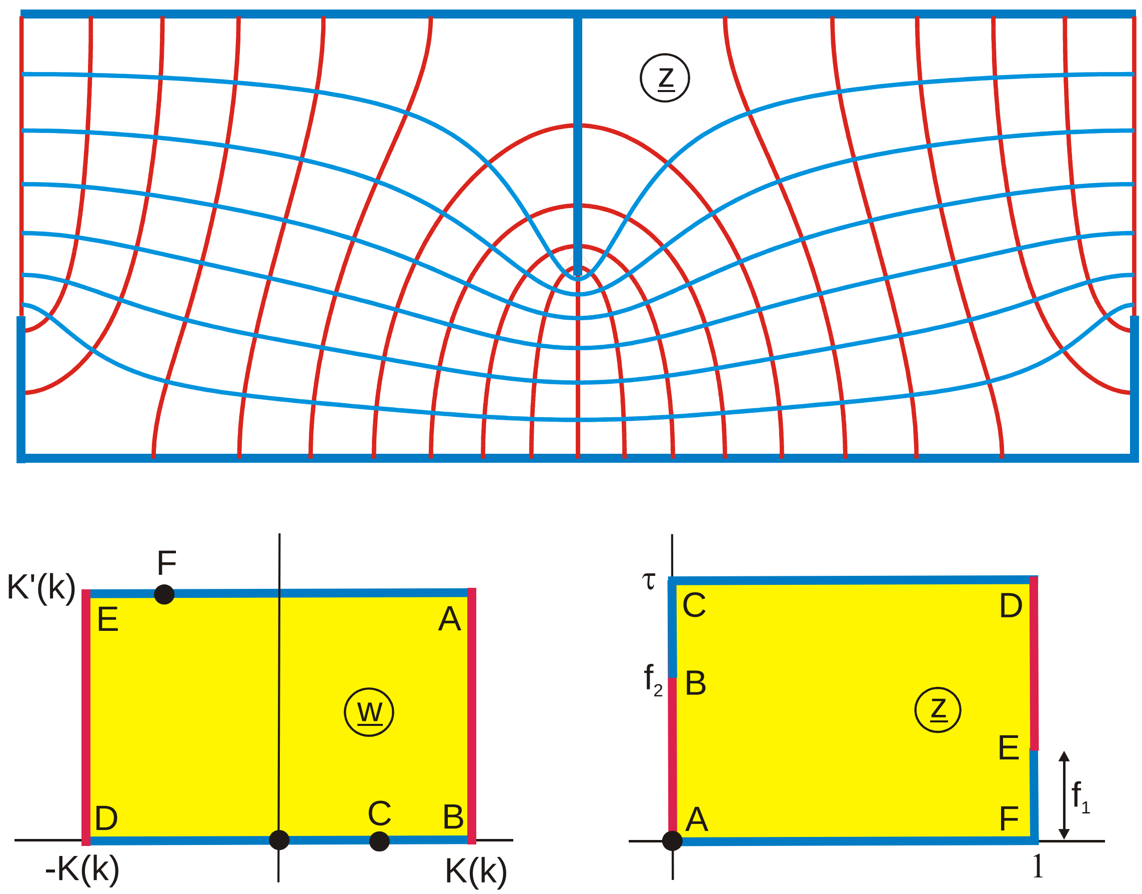


Abbildung I 2.5

$$z = \frac{1}{2} + \frac{F_a\left(\frac{w_1 + a_2 p}{b}, k_1\right)}{2K(k_1)}$$

$$w_1 = -\frac{k + \sigma\,\mathrm{sn}(w,k)}{\sigma + k\,\mathrm{sn}(w,k)}$$

$$a_1 = \frac{1}{k}\frac{k^2 - \sigma}{1 - \sigma} \qquad a_2 = \frac{1}{k}\frac{k^2 + \sigma}{1 + \sigma}$$

$$\tau = \frac{K'(k_1)}{2K(k_1)} \qquad k_1 = \frac{b}{1 + a_2 p}$$

gegeben: $k, \sigma < k^2, p < 1$ $\qquad$ $b = a_2(1 - p)$

$$f_1 = \frac{\mathrm{Im}\, F_a\left(\frac{a_2 p + a_1}{b}, k_1\right)}{2K(k_1)} \qquad f_2 = \frac{\mathrm{Im}\, F_a\left(\frac{a_2 p - 1}{b}, k_1\right)}{2K(k_1)}$$

$0 \le v \le K'(k)$ $\qquad$ $-K(k) \le u \le K(k)$

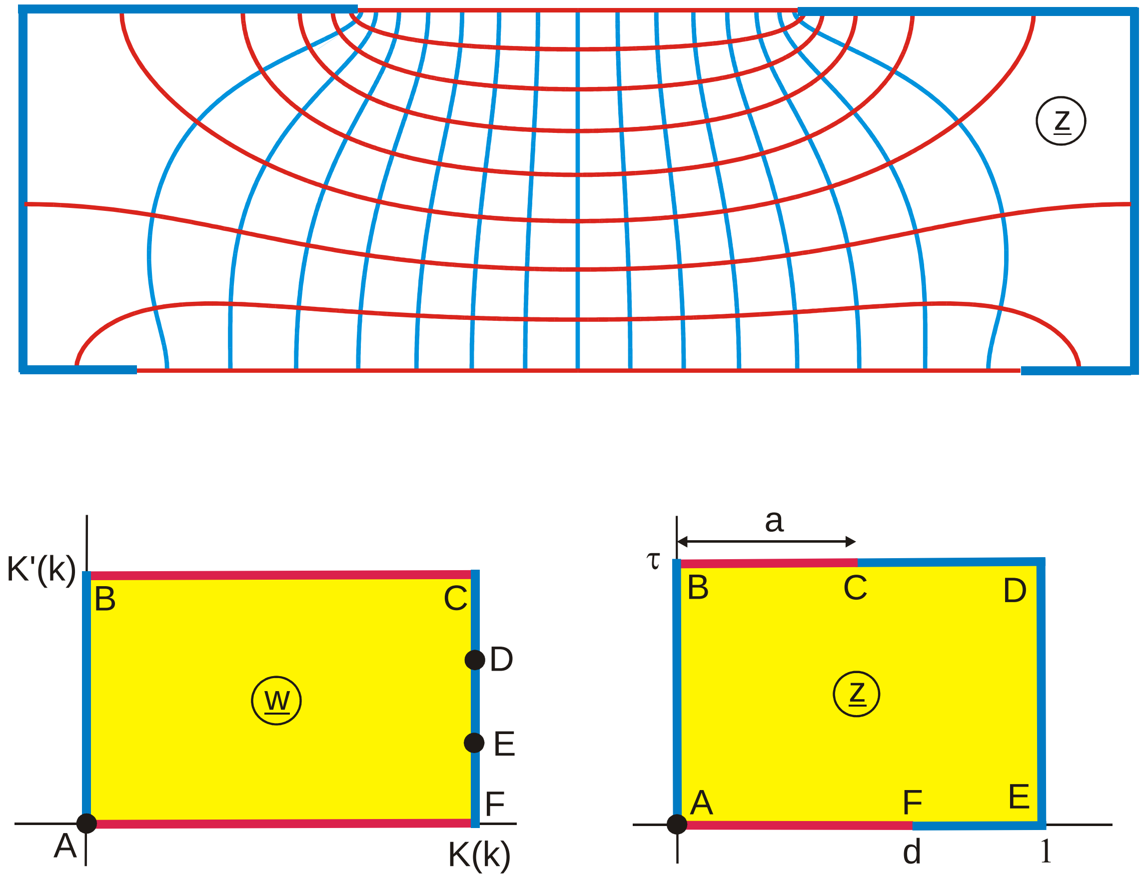


Abbildung I 2.6

$$z = F_a(w_1, k_1)/K(k_1)$$

$$w_1 = ck\ \mathrm{sn}(w,k)$$

$$\mathrm{k}_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2 \qquad \mathrm{k} = \frac{1}{\mathrm{c}}\mathrm{sn}\left[\mathrm{d\ K}(\mathrm{k}_1), \mathrm{k}_1\right]$$

$$v_D = \mathrm{Im}\, F_a\left(\frac{1}{ckk_1}, k\right) \qquad v_E = \mathrm{Im}\, F_a\left(\frac{1}{ck}, k\right)$$

$$a = \frac{1}{k_1\ \mathrm{sn}\left[a\ K(k_1), k_1\right]}$$

$0 \leq \mathrm{v} \leq \mathrm{K'(k)}$ $\qquad$ $0 \leq \mathrm{u} \leq \mathrm{K(k)}$

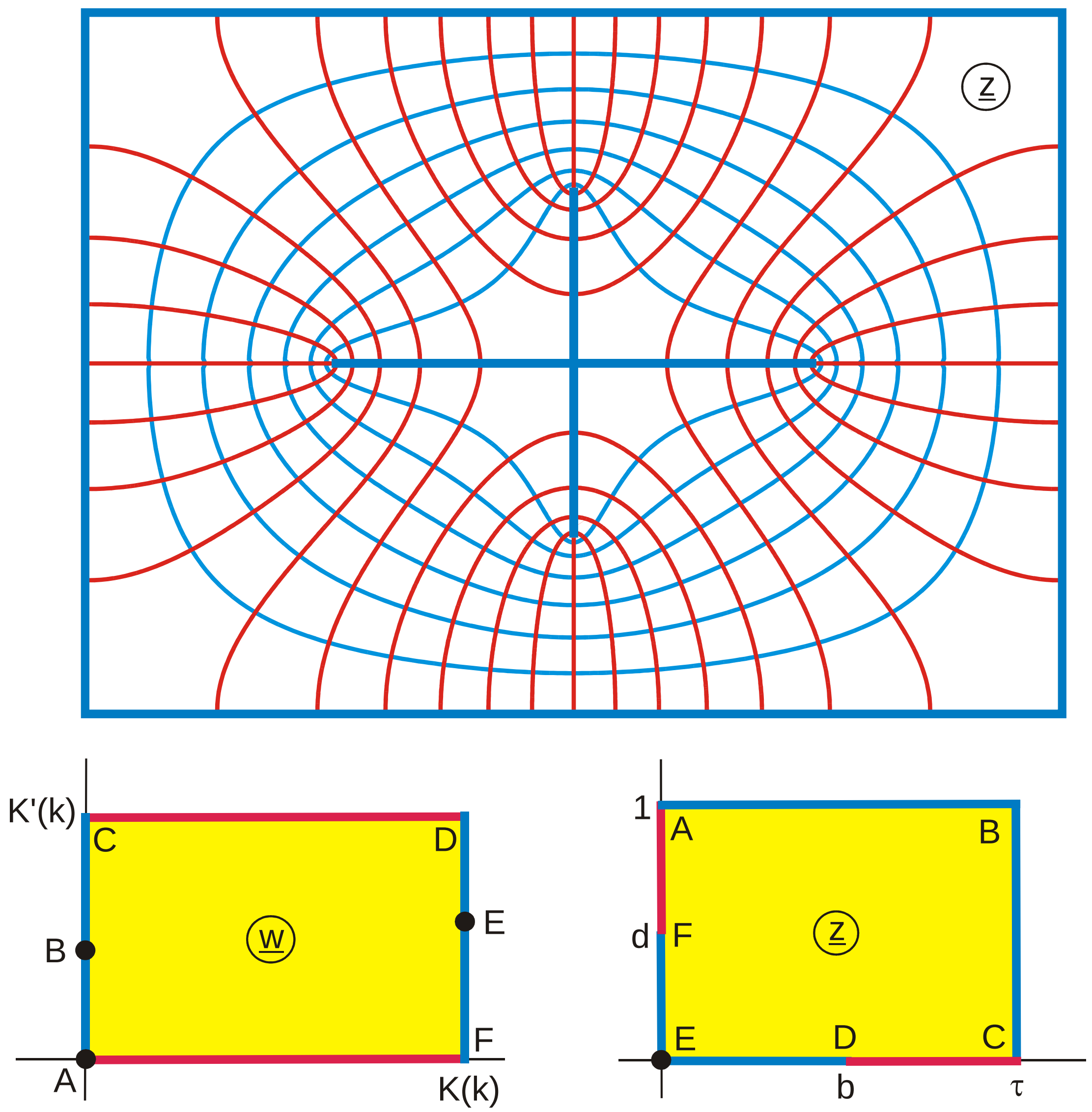


Abbildung I 2.7

$$z = j\frac{F_t(w_1,k_1)}{K(k_1)}$$

gegeben: d, b, τ

$$w_1 = \frac{\pi}{a} - \arcsin\left[a\,\mathrm{sn}(w,k)\right]$$

$$\mathrm{k}_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$\mathrm{a} = \sqrt{1-\mathrm{sn}^2\left[\mathrm{d\;K(k_1),k_1}\right]}$$

$$\mathrm{k} = \mathrm{a}\sqrt{1-\mathrm{sn}^2\left[\mathrm{b\;K(k_1),k_1'}\right]}$$

$$v_B = \mathrm{Im}\,F_a\left(j\frac{\sinh\{ar\cosh(1/k_1)\}}{a},k\right)$$

$$v_E = F_a\left(\frac{1}{a},k\right)$$

$$\mathrm{f}_1 = \frac{\mathrm{Im}\,F_a\left(\dfrac{a_2 p + a_1}{b},k_1\right)}{2K(k_1)}$$

$$\mathrm{f}_2 = \frac{\mathrm{Im}\,F_a\left(\dfrac{a_2 p - 1}{b},k_1\right)}{2K(k_1)}$$

$0 \le \mathrm{v} \le \mathrm{K'(k)}$

$0 \le \mathrm{u} \le \mathrm{K(k)}$

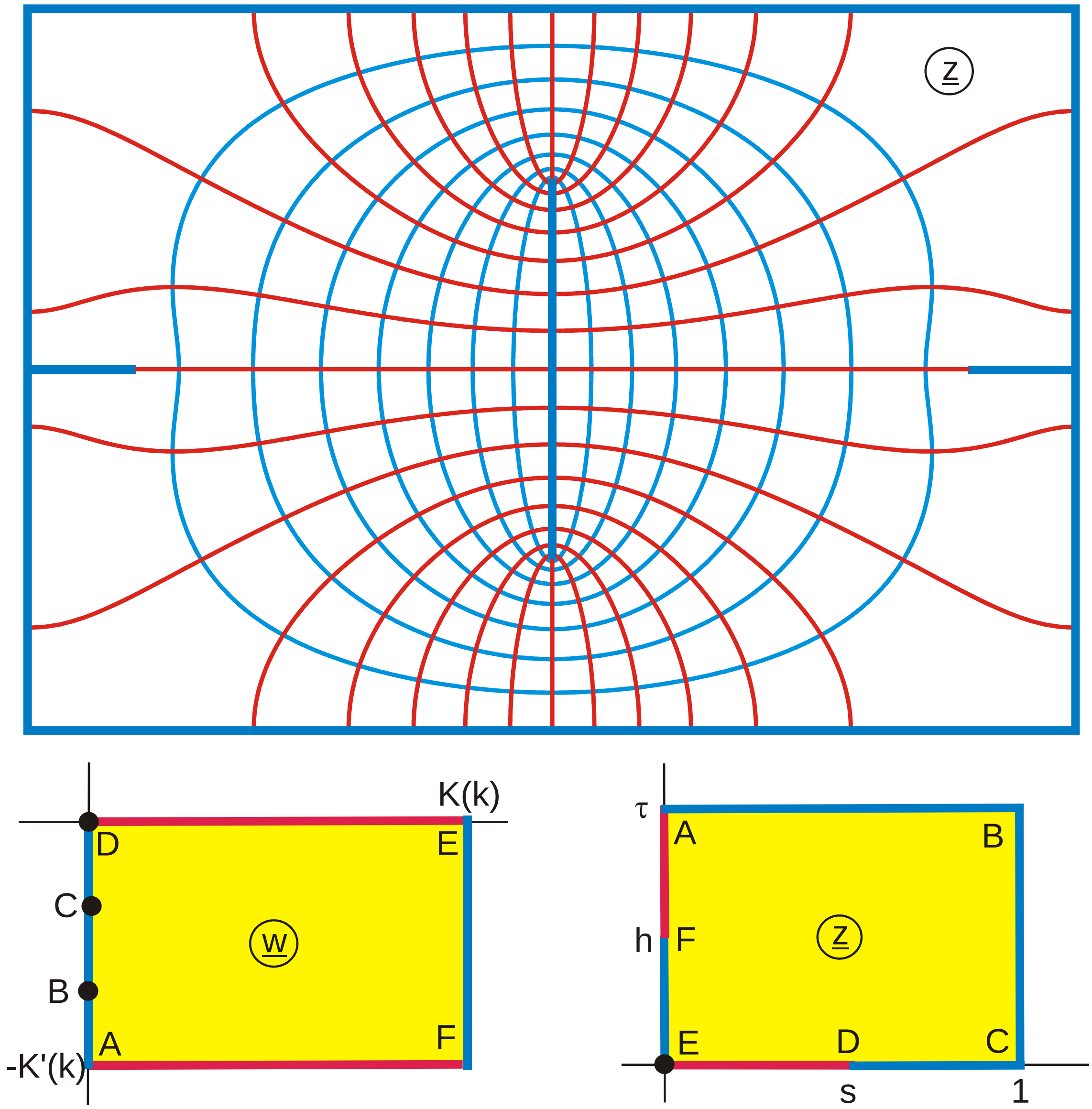


Abbildung I 2.8

$$z = \frac{F_a(w_1, k_1)}{K(k_1)}$$

gegeben: s, h, τ

$$w_1 = b\,\mathrm{cn}(w,k)$$

$$k_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$\mathrm{b} = \mathrm{sn}\left[\mathrm{s}\ \mathrm{K}(\mathrm{k}_1), \mathrm{k}_1\right]$$

$$\mathrm{s} = \mathrm{F_a}(\mathrm{b}, \mathrm{k}_1)/\mathrm{K}(\mathrm{k}_1)$$

$$\mathrm{k} = \frac{1}{\sqrt{1 + \left\{\mathrm{b}\ \mathrm{Im}\,\mathrm{sn}\left[\mathrm{jh}\ \mathrm{K}(\mathrm{k}_1), \mathrm{k}_1\right]\right\}^2}}$$

$$jh = K(k_1)\, F_a\left(jb\frac{k'}{k}, k_1\right)$$

$$\text{-K'(k)} \le \mathrm{v} \le 0$$

$$0 \le \mathrm{u} \le \mathrm{K(k)}$$

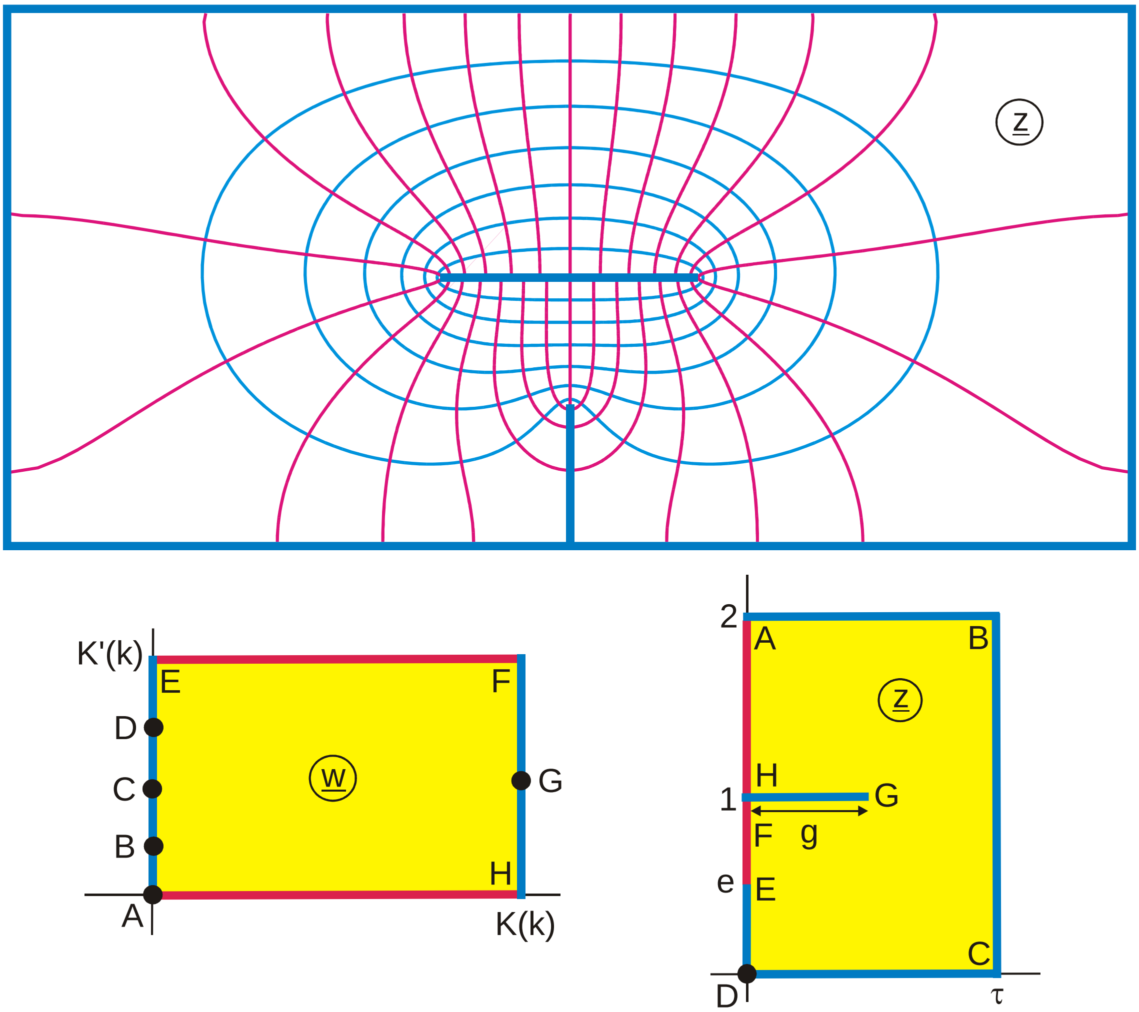


Abbildung I 2.9

$$z = -j\left\{\frac{F_a(w_4, k_2)}{K(k_2)} - 1\right\}$$

$$w_4 = jw_3 / \sqrt{k_2}$$

$$w_3 = [\mathrm{sn}(w_2 + ja, k_1) - \mathrm{sn}(w_2 - ja, k_1)]\frac{\sqrt{k_1}}{2}$$

$$k_2 = \left[\frac{\vartheta_2(0,\tau_1)}{\vartheta_3(0,\tau_1)}\right]^2$$

$$a = \operatorname{Im} F_a\left(j\frac{h}{\sqrt{k_1}}, k_1\right)$$

$$w_2 = F_a(w_1, k_1)$$

$$w_1 = \frac{k}{k_1}\mathrm{sn}(w, k)$$

$$\tau = \frac{K'(k_1)}{K(k_1)}$$

$$k_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$k = k_1 \mathrm{sn}(d, k_1)$$

$0 \le v \le K'(k)$

$0 \le u \le K(k)$

gegeben: $D = 0{,}45$, $\tau = 1{,}4$, $\tau_1 = 1{,}971$

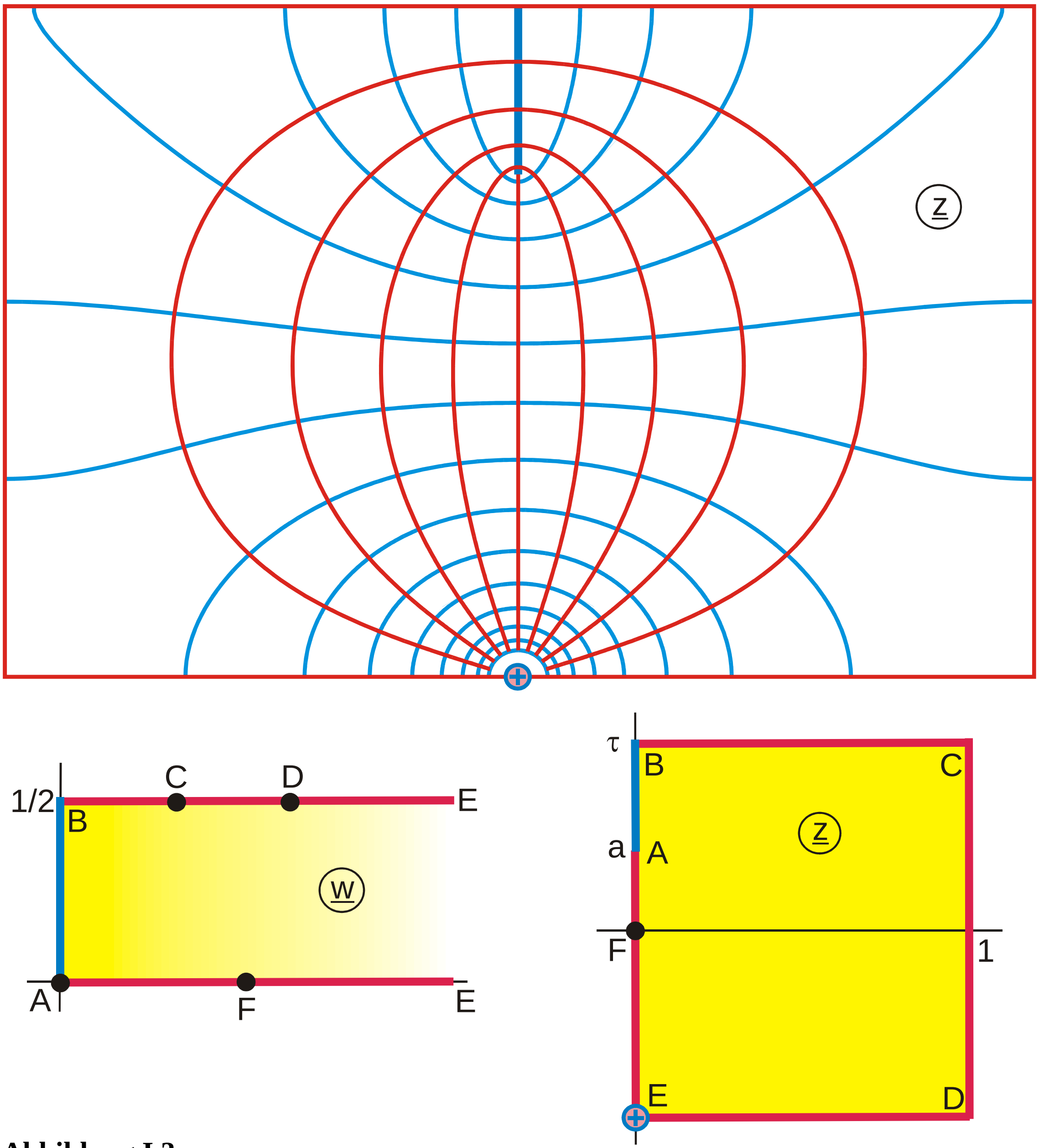


Abbildung I 3

$$z = \frac{F_t(w_2, k)}{K(k)}$$

$$w_2 = -j(w_1 + a)$$

$$w_1 = \ln\cosh(w\pi)$$

$$k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

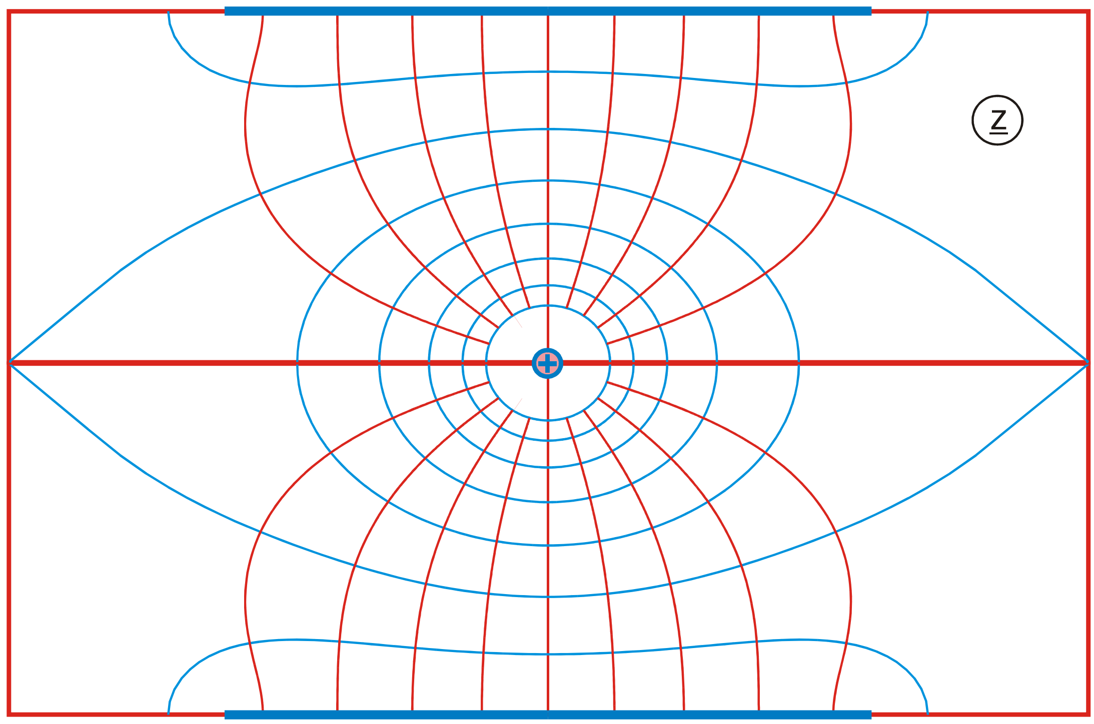
$$a = \operatorname{ar}\tanh \operatorname{sn}\left[-b\,K(k), k'\right]$$

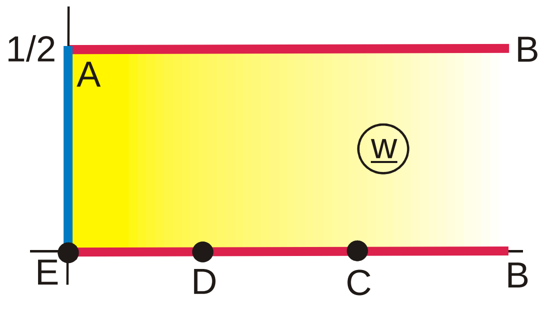
$$u_F = \frac{1}{\pi}\operatorname{ar}\cosh \exp(-a)$$

$$u_C = \frac{1}{\pi}\operatorname{ar}\sinh \exp\left\{\left(-\operatorname{ar}\cosh\frac{1}{k}\right) - a\right\}$$

$$u_D = \frac{1}{\pi}\operatorname{ar}\sinh \exp\left\{\left(+\operatorname{ar}\cosh\frac{1}{k}\right) - a\right\}$$

$$0 \le v \le 0{,}5$$





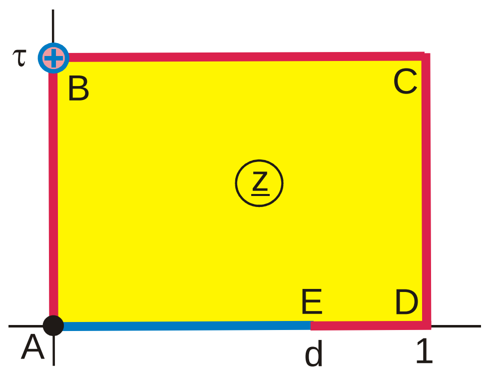


Abbildung I 3.1

$$z = \frac{F_a(w_1,k)}{K(k)}$$

$$w_1 = a\cosh(w\pi)$$

$$k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$a = \mathrm{sn}[d\,K(k),k]$$

$$d = F_a(a,k)/K(k)$$

$$u_C = \frac{1}{\pi}\operatorname{ar}\cosh\frac{1}{ak}$$

$$u_D = \frac{1}{\pi}\operatorname{ar}\cosh\frac{1}{a}$$

$0 \le v \le 0{,}5$

$0 \le u \le 0{,}7$

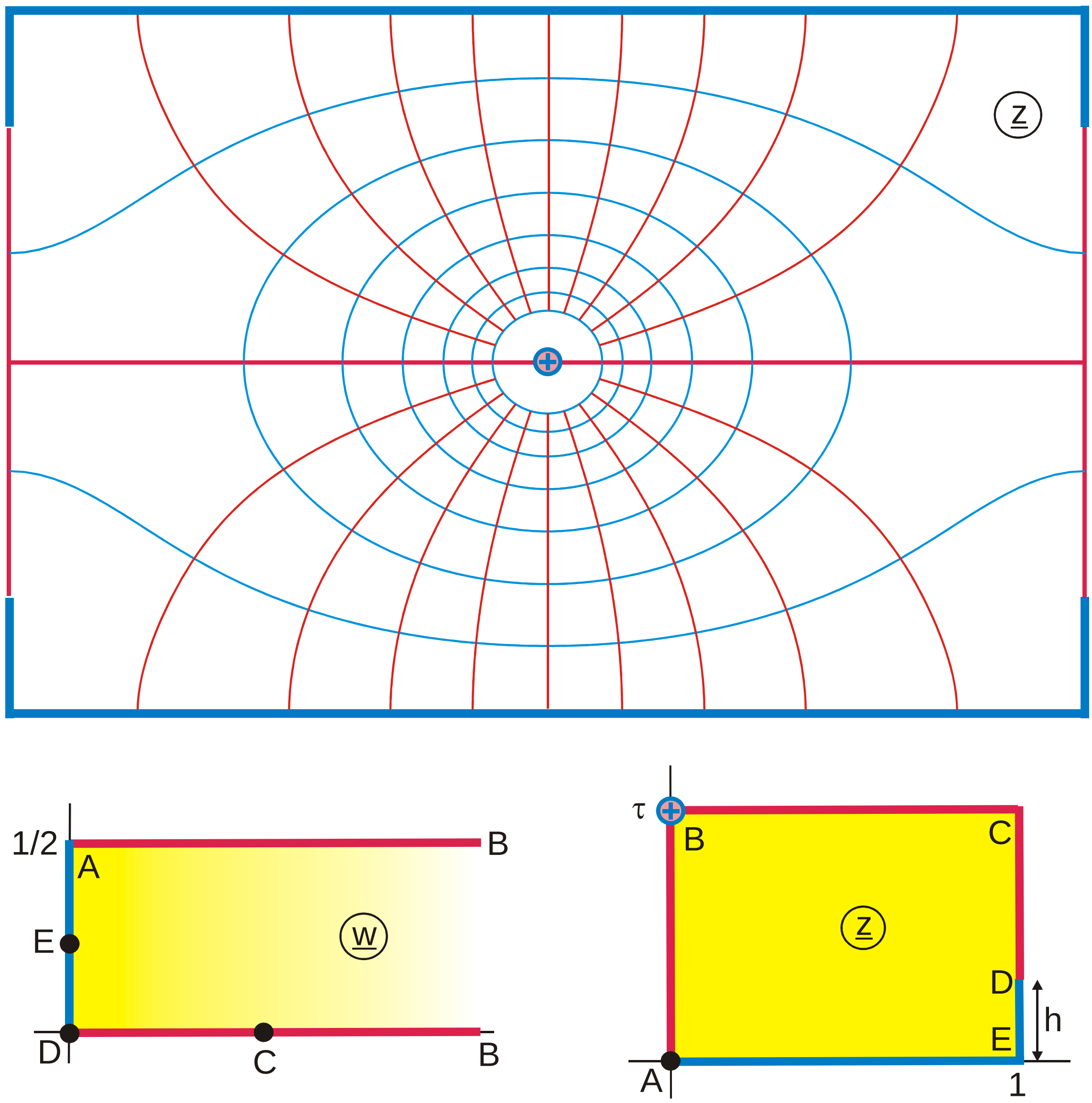


Abbildung I 3.2

$$z = \frac{F_a\left(w_1, k\right)}{K(k)}$$

$$w_1 = a\cosh(w\pi)$$

$$k = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$a = \operatorname{sn}\left[K(k) + jd\,K(k), k\right]$$

$$u_C = \frac{1}{\pi}\operatorname{ar\,cosh}\frac{1}{ak}$$

$$v_E = \frac{1}{\pi}\arccos\frac{1}{a}$$

$0 \leq v \leq 0{,}5$

$0 \leq u \leq 0{,}7$

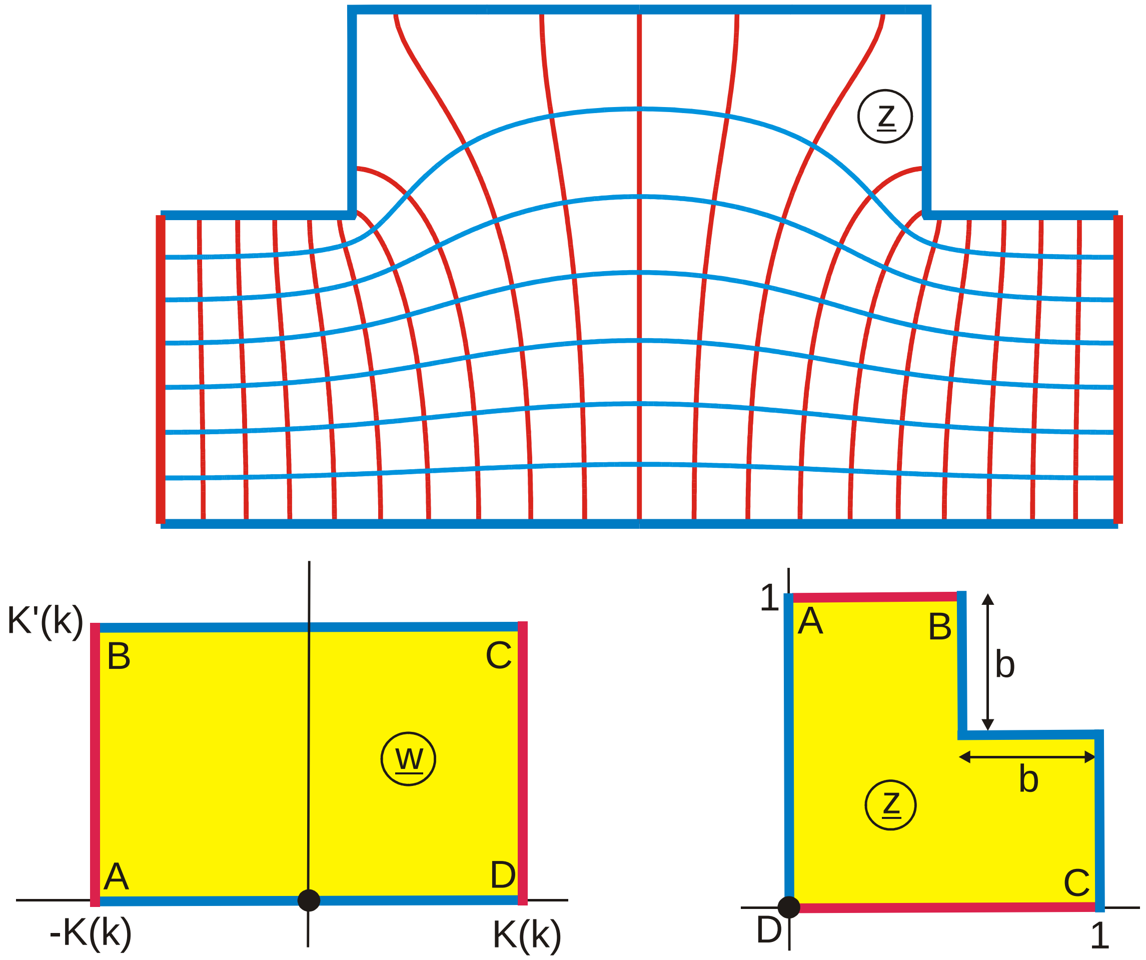


Abbildung I 4

$$z = \frac{F_a(w_4, k_1) + F_a(w_4, k_1')}{K(k_1) + K'(k_1)}$$

$$w_3 = \frac{2w_2(1+k)}{(1+w_2)(1+kw_2)}$$

$$w_4 = \sqrt{w_3}$$

$$w_2 = 1 - (1+w_1)(1+1/k)/2$$

$$w_1 = -\frac{k_2 + \sigma\,\mathrm{sn}(w, k_2)}{\sigma + k_2\,\mathrm{sn}(w, k_2)}$$

$$\tau_1 = \frac{1-b}{1+b}$$

$$k_1 = \left[\frac{\vartheta_2(0, \tau_1)}{\vartheta_3(0, \tau_1)}\right]^2$$

$$k = \left(\frac{k_1 - k_1'}{k_1 + k_1'}\right)^2$$

$$a_1 = \frac{3k-1}{k+1}$$

$$a_2 = \frac{k-1}{k+1}$$

$$k_2 = \frac{1-a_1a_2}{a_1-a_2} - \sqrt{\left(\frac{1-a_1a_2}{a_1-a_2}\right)^2 - 1}$$

$$\sigma = k_2\frac{k_2 - a_1}{1 - k_2a_1}$$

$-K(k) \le u \le K(k)$

$0 \le v \le K'(k)$

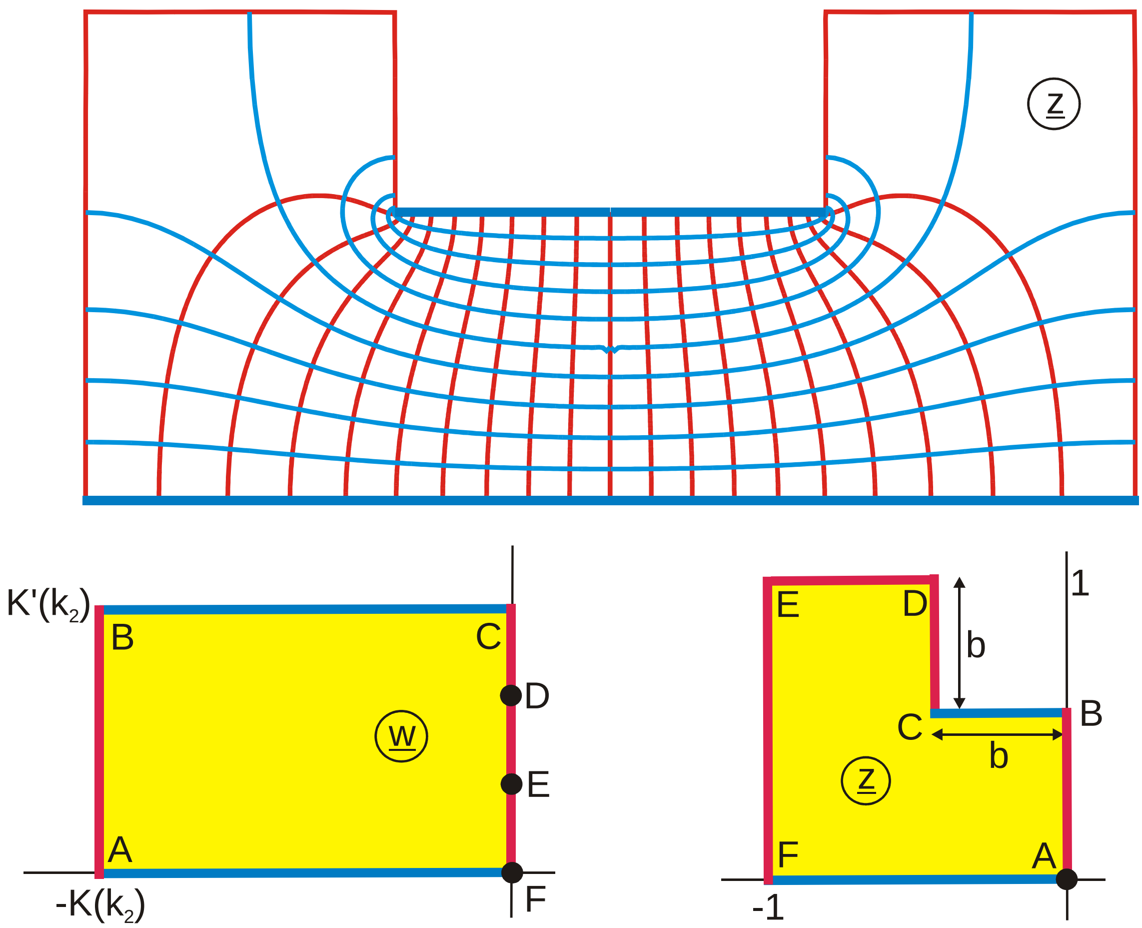


Abbildung I 4.1

$$z = \frac{F_a(w_3,k_1) + F_a(w_3,k_1')}{K(k_1) + K'(k_1)} - 1$$

$$w_2 = \frac{2w_1(1+k)}{(1+w_1)(1+kw_1)}$$

$$w_3 = \sqrt{w_2}$$

$$w_1 = \mathrm{sn}^2(w,k_2)$$

$$\tau_1 = \frac{1-b}{1+b}$$

$$k_1 = \left[\frac{\vartheta_2(0,\tau_1)}{\vartheta_3(0,\tau_1)}\right]^2$$

$$k = \left(\frac{k_1 - k_1'}{k_1 + k_1'}\right)^2$$

$$k_2 = \sqrt{k}$$

$-K(k_2) \le u \le 0$

$0 \le v \le K'(k_2)$

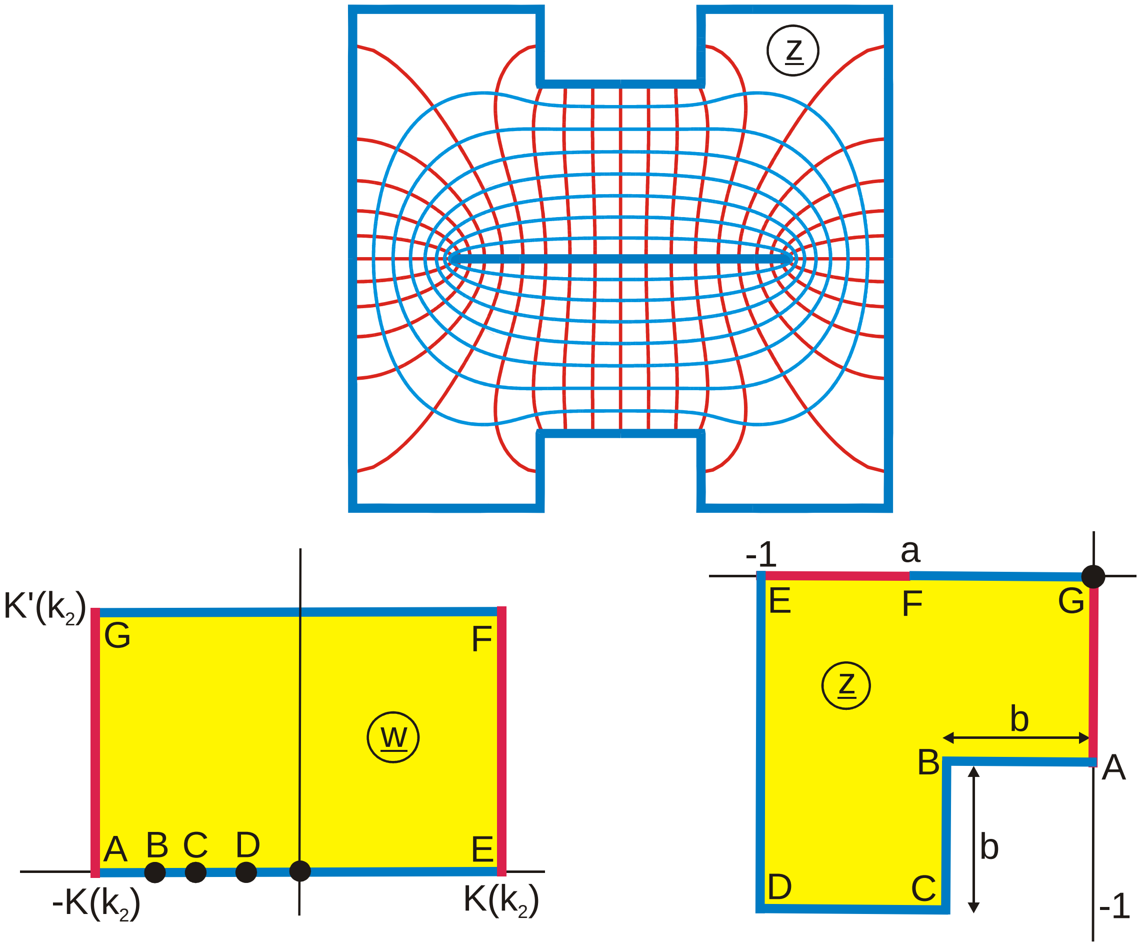


Abbildung I 4.2

$$z = \frac{F_a(w_4, k_1) + F_a(w_4, k_1')}{K(k_1) + K'(k_1)} - b - j(1-b)$$

$$w_3 = \frac{2w_2(1+k)}{(1+w_2)(1+kw_2)}$$

$$w_4 = \sqrt{w_3}$$

$$w_2 = (1+w_1)/(2k)$$

$$w_1 = -\frac{k_2 + \sigma\, \mathrm{sn}(w, k_2)}{\sigma + k_2\, \mathrm{sn}(w, k_2)}$$

$$\tau_1 = \frac{1-b}{1+b}$$

$$k_1 = \left[\frac{\vartheta_2(0, \tau_1)}{\vartheta_3(0, \tau_1)}\right]^2$$

$$k = \left(\frac{k_1 - k_1'}{k_1 + k_1'}\right)^2$$

gegeben: b, a_2 mit $-1 < a_2 < 0$

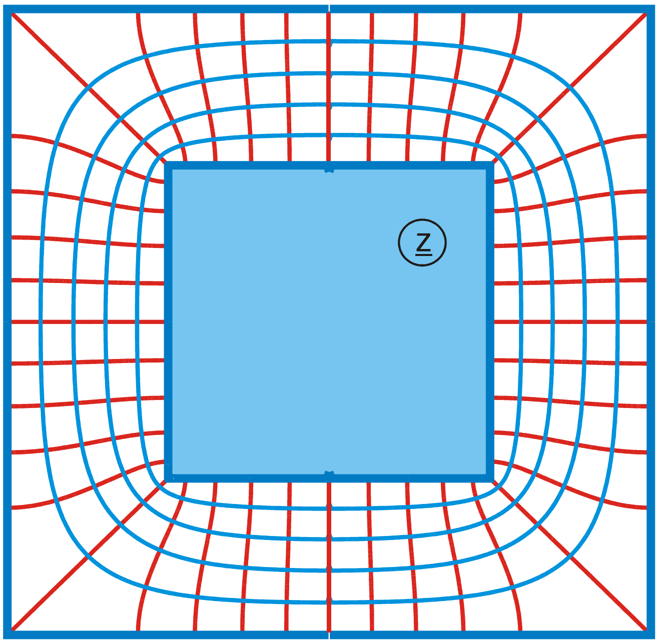
$$a_1 = 2k - 1$$

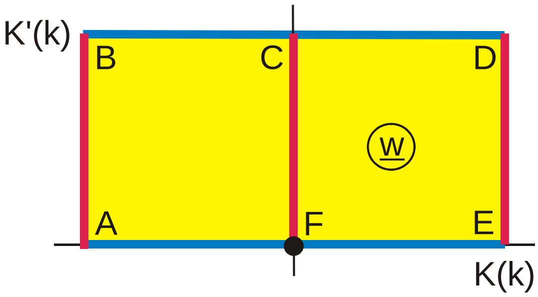
$$k_2 = \frac{1 - a_1 a_2}{a_1 - a_2} - \sqrt{\left(\frac{1 - a_1 a_2}{a_1 - a_2}\right)^2 - 1}$$

$$\sigma = k_2 \frac{k_2 - a_1}{1 - k_2 a_1}$$

$-K(k) \le u \le K(k)$

$0 \le v \le K'(k)$





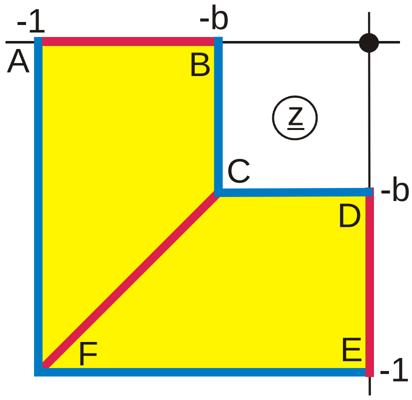


Abbildung I 5

$$z = \frac{F_a(w_3, k_1) + F_a(w_3, k_1')}{K(k_1) + K'(k_1)} - 1 - j \qquad w_2 = \frac{2w_1(1+k)}{(1+w_1)(1+kw_1)}$$

$$w_3 = \sqrt{w_2} \qquad w_1 = \mathrm{sn}(w, k)$$

$$\tau_1 = \frac{1-b}{1+b}$$

$$k_1 = \left[\frac{\vartheta_2(0, \tau_1)}{\vartheta_3(0, \tau_1)}\right]^2 \qquad k = \left(\frac{k_1 - k_1'}{k_1 + k_1'}\right)^2$$

$-K(k) \le u \le K(k)$ $\qquad$ $0 \le v \le K'(k)/2$

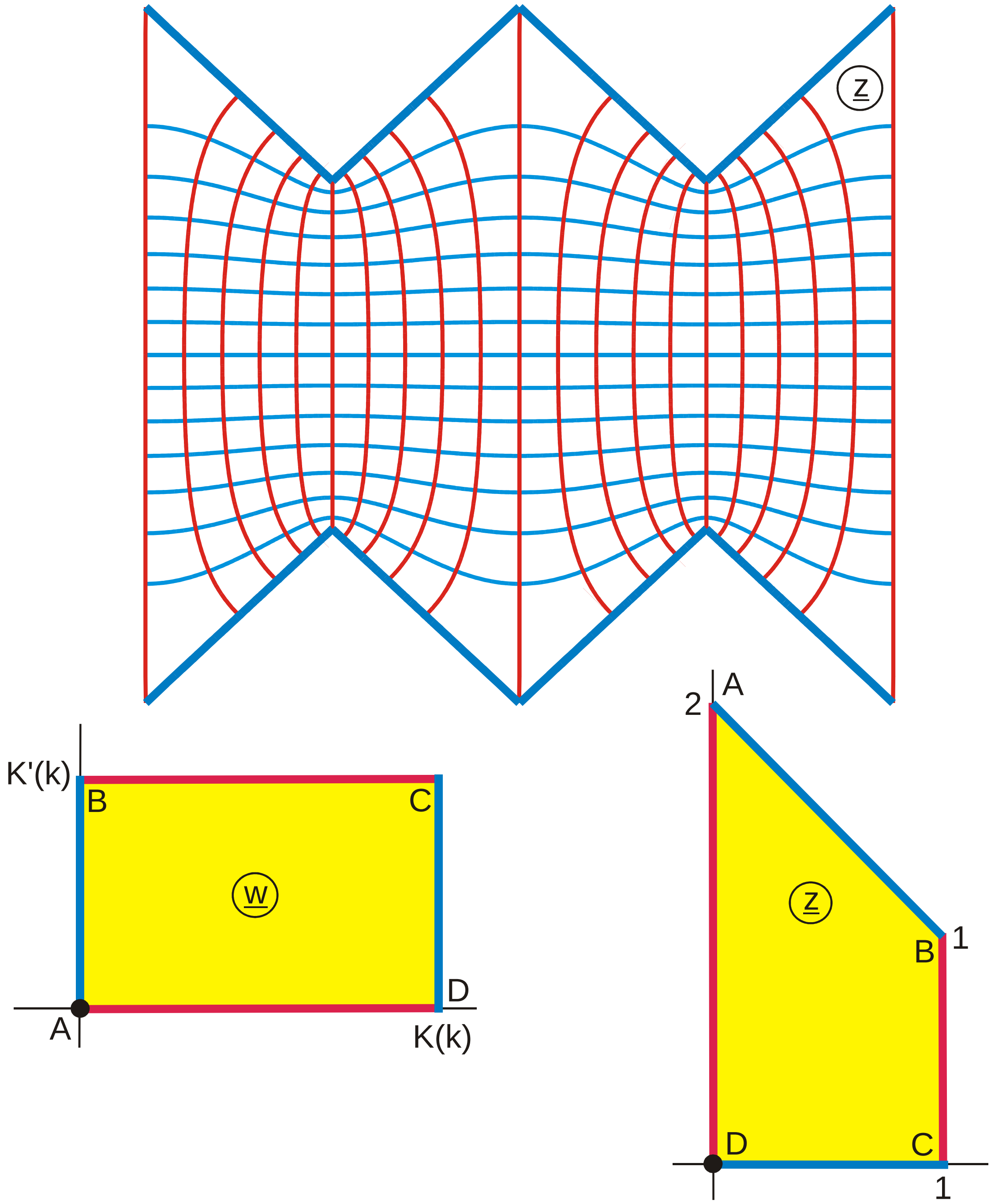


Abbildung I 5.1

$$z = j\{1 - F_a(w_2, k_1)\}$$

$$w_2 = \sqrt{2}\sin\left(\frac{3}{2}w_1 - \frac{\pi}{4}\right)$$

$$w_1 = \arcsin\left[k\,\mathrm{sn}(w,k)\right]$$

$$k_1 = \frac{1}{\sqrt{2}}$$

$$k = \frac{\sqrt{3}}{2}$$

$0 \le u \le K(k)$

$0 \le v \le K'(k)$

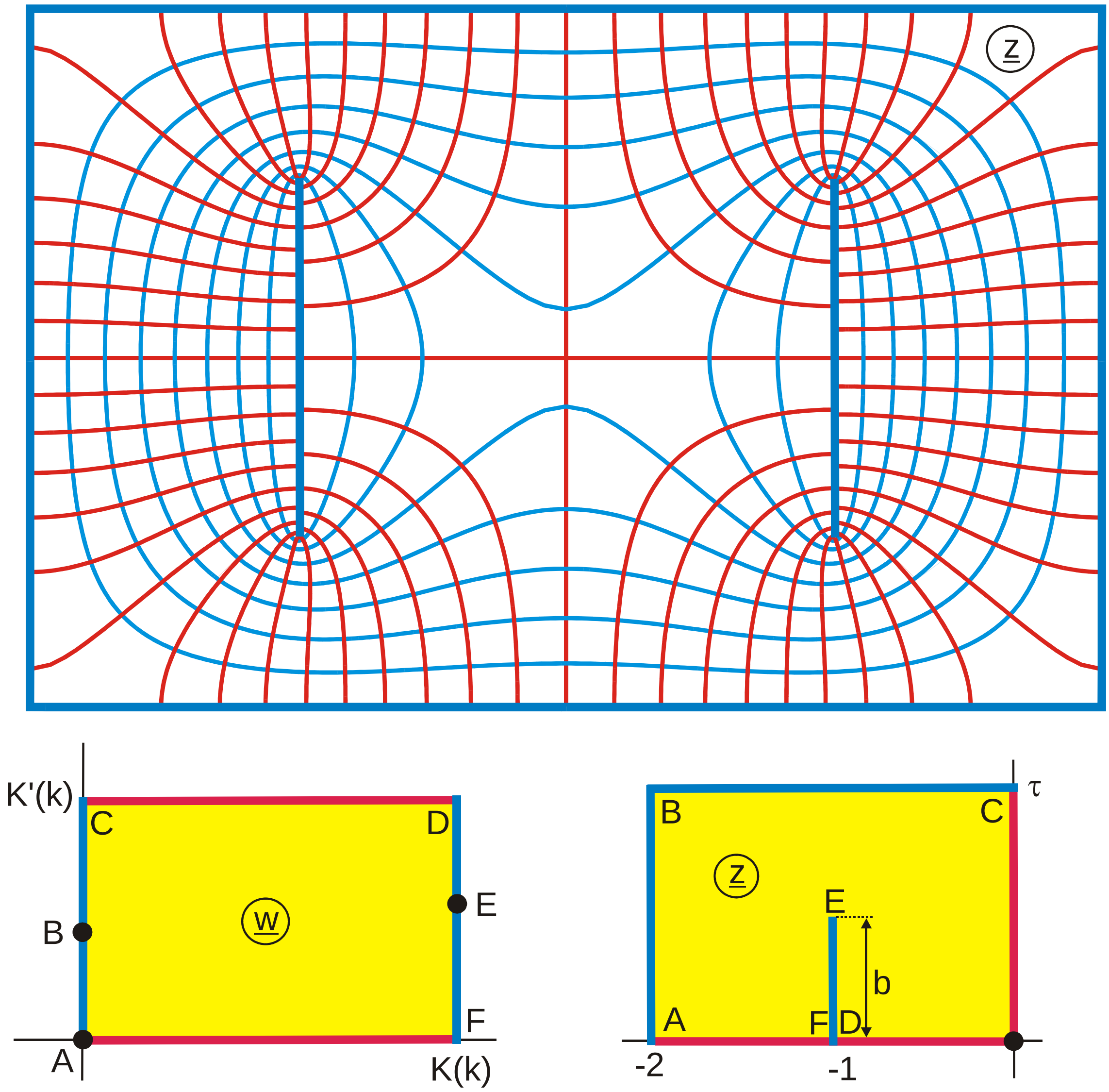


Abbildung I 6

$$z = \frac{F_a(w_2, k_1)}{K(k_1)} - 1 \qquad w_2 = jw_1/h$$

$$w_1 = \left[\operatorname{sn}(w + ja, k) - \operatorname{sn}(w - ja, k)\right]\frac{\sqrt{k}}{2} \qquad k_1 = \left[\frac{\vartheta_2(0,\tau)}{\vartheta_3(0,\tau)}\right]^2$$

$$a = \operatorname{Im} F_a\left(j\frac{h}{\sqrt{k}}, k\right) \qquad b = \frac{F_a(js, k_1)}{K(k_1)}$$

$$v_E = F_a\left(\sqrt{\frac{1 + k^2 \operatorname{sn}^2(ja,k)}{2 - k'^2 + 2k^2 \operatorname{sn}^2(ja,k)}}, k'\right) \qquad h = \sqrt{k_1}$$

$$s = \frac{\sqrt{k}}{2h}\left[\operatorname{sn}\{K(k) + j(v_E + a), k\} - \operatorname{sn}\{K(k) + j(v_E - a), k\}\right]$$

$0 \le v \le K'(k)$ $\qquad$ $0 \le u \le K(k)$