$$X = \sqrt{\underbrace{3x+10}_{x=-10/3}} \quad |()^2 \qquad \mathbb{D} = x \in \mathbb{R}^{\geq -10/3}$$

$$x^2 = 3x + 10 \qquad | -3x - 10$$

$$x^2 - 3x - 10 = 0$$ Nullform

$$(x-5)(x+2) = 0$$

$$x_1 = 5 \quad \vee \quad x_2 = -2$$ Ergebnis

Probe: $5 = \sqrt{15+10} = \sqrt{25} = 5$ ✓

$-2 = \sqrt{-6+10} = \sqrt{4} = 2$ ⚡

$\mathbb{L} = \{5\}$ Lösung

1) $6 \cdot \ln \sqrt[3]{e^2} - \frac{8}{e^{2\ln 0{,}5}} - \left(\frac{1}{2} e^{\ln 3^2} - \ln \frac{1}{\sqrt{e}}\right) + \frac{8}{\ln e^2} + e^{2\ln 3}$

$6 \cdot \ln e^{2/3} - \frac{8}{e^{\ln 0{,}5^{-2}}} - \left(1/2 \cdot 3^2 - \ln e^{-1/2}\right) + 8/2 + e^{\ln 3^2}$

$6 \cdot 2/3 - \frac{8}{(1/2)^2} - \left(\frac{9}{2} + \frac{1}{2}\right) + 4 + 3^2$

$4 - 32 - 5 + 4 + 9 = -20$

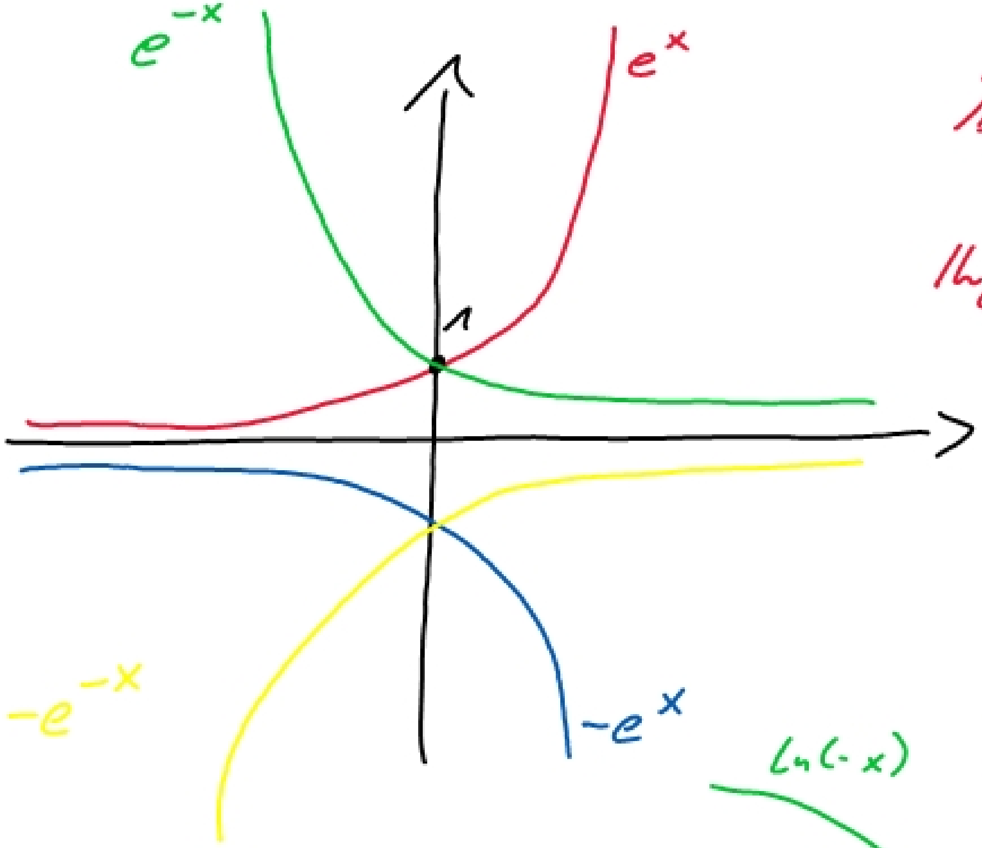
$\ln e^{2/3} = \frac{2}{3} \cdot \ln e = \frac{2}{3} \cdot 1 = \frac{2}{3}$

$\ln e^1$

$\ln(x)$ e^x $\Downarrow$ 1

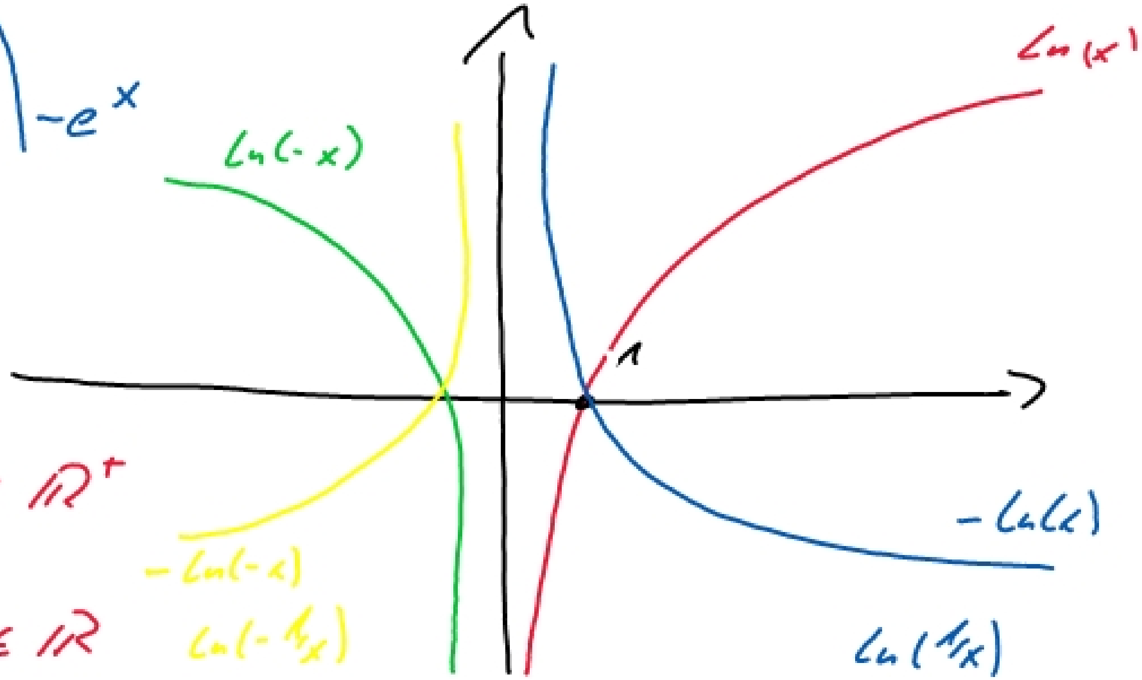
$\log(x)$ 10^x $\Downarrow$ 1

$(\ln e)^{2/3} = 1$



$\mathbb{D}_{e^x} = x \in \mathbb{R}$

$\mathbb{W}_{e^x} = y \in \mathbb{R}^+$



$\mathbb{D}_{\ln(x)} = x \in \mathbb{R}^+$

$\mathbb{W}_{\ln(x)} = x \in \mathbb{R}$

I 1) $3\cdot\log x - 4\cdot\log \frac{2}{x} - \frac{1}{3}\cdot\log (x^2)^6 = \frac{2}{3}\cdot\log 27 + \frac{1}{2}\log(x^4) - 2\cdot\log 6$

$$\log x^3 - \log \left(\frac{2}{x}\right)^4 - \log (x^{12})^{\frac{1}{3}} = \log(27)^{\frac{2}{3}} + \log(x^4)^{\frac{1}{2}} - \log 6^2$$

$$\log \frac{x^3}{\cancel{\frac{2^4}{x^4}}\; x^4} = \log \frac{3^2\cdot x^2}{6^2} \quad \Big/ \; 10^x$$

$$\frac{x^3}{2^4} = \frac{3^2 x^2}{6^2} \quad \Big/ \cdot 2^4 \; : x^2$$

$$x = \frac{(3^2\cdot 2^2)\cdot 2^2}{6^2} = \frac{(3\cdot 2)^2}{6^2}\cdot 2^2 = 4 \text{ (Ergebnis)}$$

$\mathbb{D} = x \in \mathbb{R}^+$

$\mathbb{L} = \{4\}$

$$27^{\frac{2}{3}} = \left(27^{\frac{1}{3}}\right)^2 = \left(\sqrt[3]{27}\right)^2 = 3^2$$