$$x = \sqrt{\underbrace{4x}_{x=-5/4} + 5} \quad | \uparrow^2 \qquad , \mathbb{D} = x \in \mathbb{R}^{\geq -5/4}$$

$$x^2 = 4x + 5 \qquad | -4x - 5$$

$$x^2 - 4x - 5 = 0 \qquad \text{Nullform}$$

$$(x-5)(x+1) = 0$$

$$x_1 = 5 \quad \vee \quad x_2 = -1 \qquad \text{Ergebnis}$$

Probe: $x_1 = 5$: $5 = \sqrt{4 \cdot 5 + 5} = \sqrt{25} = 5$ ✓

$x_2 = -1$: $-1 = \sqrt{4 \cdot (-1) + 5} = \sqrt{1} = 1$ $\lightning$

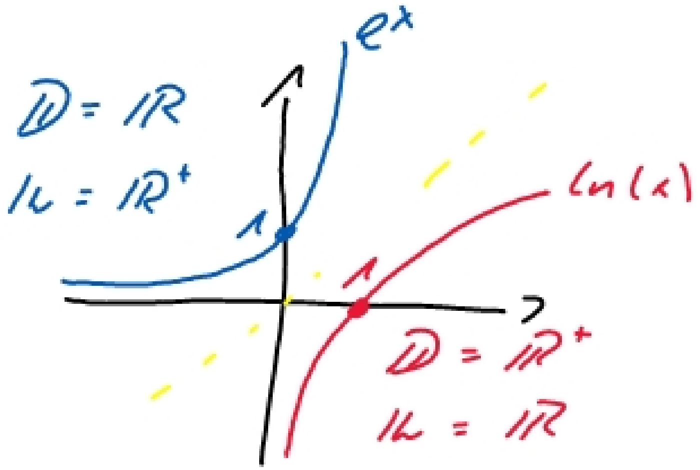
$$\mathbb{L} = \{5\} \qquad \text{Lösung}$$

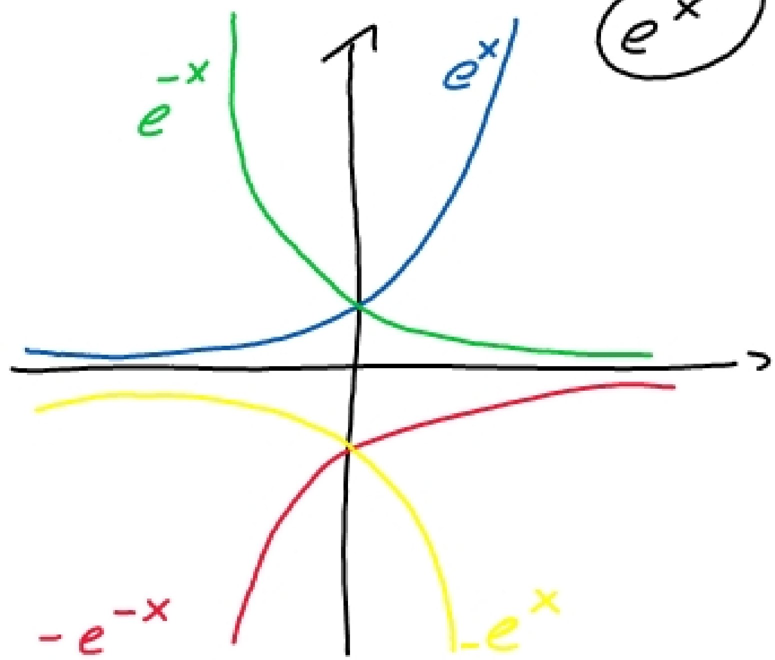
3) $\frac{1}{6}\operatorname{ld} 2^3 + 3\cdot e^{2\ln 0{,}5} - \lg\sqrt{10} + 4\cdot\left(2^{4\operatorname{ld}\frac{1}{2}} - 8\cdot\ln\frac{1}{\sqrt{e}}\right) - 4\cdot 10^{\frac{1}{4}\lg 256}$

$\frac{1}{2} + 3\cdot e^{\ln(\frac{1}{2})^2} - \lg 10^{\frac{1}{2}} + 4\cdot\left(2^{\operatorname{ld}(2^{-1})^4} - 8\cdot\ln e^{-\frac{1}{2}}\right) - 4\cdot 10^{\lg 256^{\frac{1}{4}}}$

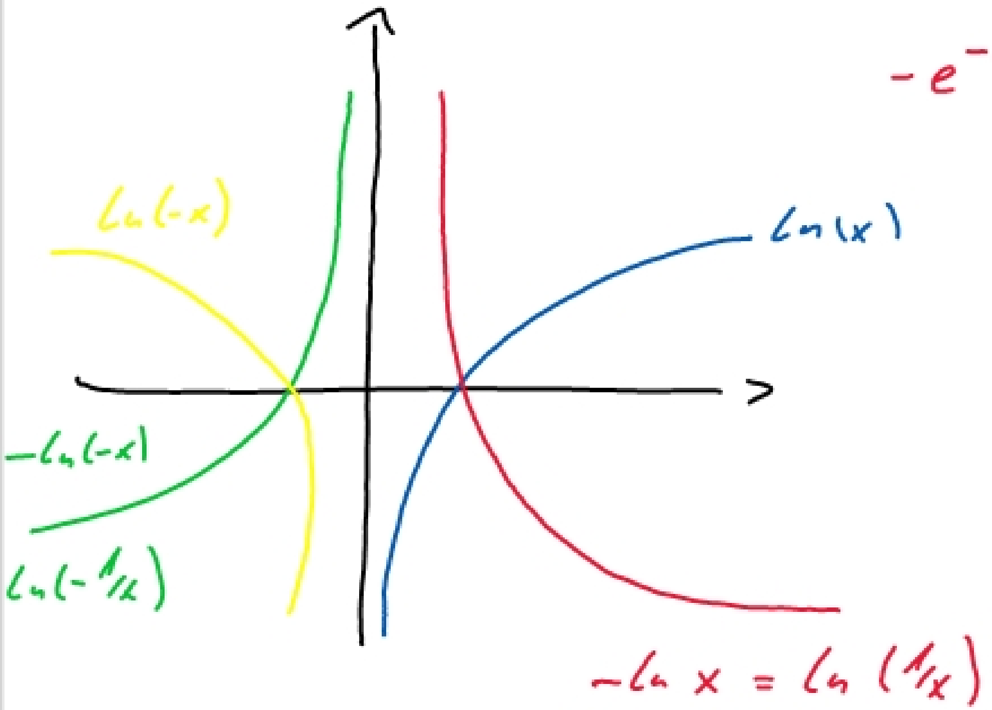
$\underline{\frac{1}{2}} + \frac{3}{4} - \underline{\frac{1}{2}} + 4\cdot\left(\frac{1}{16} - 8\cdot\left(-\frac{1}{2}\right)\right) - 4\cdot 256^{\frac{1}{4}}$

$\frac{3}{4} + \frac{1}{4} + \underline{16} \underline{- 4\cdot 4} = 1$





$\boxed{e^x}$



$$f(x) = \ln(\heartsuit)$$

$$f'(x) = \frac{1}{\heartsuit} \cdot \heartsuit'$$

$$f(x) = \ln 3x^2 \to f'(x) = \frac{1}{3x^2} \cdot 6x$$
$$= 2/x$$

2) $3 \cdot \ln 4 - \frac{1}{2} \cdot \ln \frac{16}{x^4} + 2 \cdot \ln 8 = \frac{3}{2} \ln x^4 - 8 \cdot \ln \sqrt[4]{\frac{1}{x}} - 2 \cdot \ln \frac{1}{4}$

$\ln 4^3 - \ln \left(\frac{16}{x^4}\right)^{\frac{1}{2}} + \ln 8^2 = \ln \left(x^4\right)^{\frac{3}{2}} - \ln \left(\left(\frac{1}{x}\right)^{\frac{1}{4}}\right)^8 - \ln \left(\frac{1}{4}\right)^2$

$\ln \frac{4^3 \quad 8^2}{4/x^2} = \ln \frac{x^6}{1/x^2 \; 1/4^2} \quad | \; \uparrow e^x$

$4^2 \cdot 8^2 \cdot x^2 = 4^2 \cdot x^8 \quad | : 4^2 : x^2$

$8^2 = 64 = x^6 \quad | \sqrt[6]{}$

$2 = x \quad \mathbb{L} = \{2\}$