

S. 142 ① a.)  $x = 3$

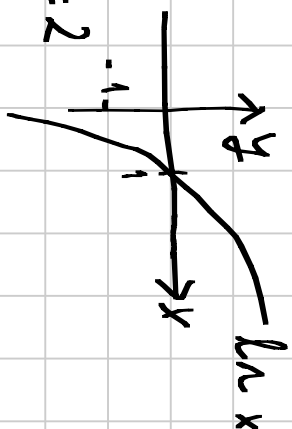
b.)  $x_1 = 1,5; x_2 = -1,1$

c.)  $x_1 = 0; x_2 = -2$

d.)  $x = 1$

e.)  $x_1 = -2; x_2 = 2$

f.)  $x_1 = 0; x_2 = 1$



Satz von Nullprodukt!

S. 142 ② a.)  $e^x \cdot x^8 - e^x = 0$   $e^x$  ausklammern

$e^x (x^8 - 1) = 0$  Nullprodukt

$x = -1$

b.)  $\frac{x^2 - 2}{e^x - 1} = 0$   $\cdot (e^x - 1)$

$x^2 - 2 = 0$

$x = \pm \sqrt{2}$

c.)  $e^{3x} - 1 = 0$   $+1$   
 $e^{3x} = 1$   $\ln$

$\ln e^{3x} = \ln 1$   
 $3x = \underbrace{\ln 1}_0$

$x = 0$

S. 142 (3)

a.)  $f(x) = x \cdot e^x$

$$f'(x) = x \cdot e^x + 1 \cdot e^x$$

$$x \cdot e^x + e^x = 0$$

$$e^x(x+1) = 0 \Rightarrow \underline{\underline{x = -1}}$$

$\neq 0 \forall x$

d.)  $f(x) = e^{2x} - 2e^x - 12x$

$$f'(x) = 2e^{2x} - 2e^x - 12$$

Substitution:  $e^x = u$

$$2u^2 - 2u - 12 = 0 \quad | :2$$

$$u^2 - 1 \cdot u - 6 = 0$$

$$(u+2)(u-3) = 0 \Rightarrow \underbrace{u_1 = -2; u_2 = 3}$$

keine  $x$ -Lös.

Vieta

$2 + (-3) = -1$
$2 \cdot (-3) = -6$

$$\underline{\underline{x = 3}}$$

g)  $f(x) = e^x \cdot (x^2 - 3)$

[PR]

$$f'(x) = e^x \cdot (2x) + e^x(x^2 - 3)$$

$$(x+3)(x-1) = 0$$

$$e^x(2x + x^2 - 3) = 0 \Leftrightarrow$$

$$\underline{\underline{x_1 = -3}}; \underline{\underline{x_2 = 1}}$$

$\neq 0 \forall x$