

567 Nr.3

$$b) f(x) = \frac{e^x}{x} = e^x \cdot x^{-1} \Rightarrow f'(x) = e^x \cdot x^{-1} + e^x \cdot (-1)x^{-2}$$

Hauptnenner und  $e^x$  ausklammern  $\Rightarrow$

$$f'(x) = \frac{e^x}{x} - \frac{e^x}{x^2} = \frac{e^x(x-1)}{x^2}$$

$$c) f(x) = \frac{x}{e^x} = x \cdot e^{-x} \Rightarrow f'(x) = 1 \cdot e^{-x} + x \cdot e^{-x} \cdot (-1)$$

$$f'(x) = \frac{1}{e^x} + \frac{-x}{e^x} = \frac{1-x}{e^x}$$

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

$$f'(x) = e^x(x+2)$$

$$e) f(x) = \frac{x}{e^{-0,5x}} = x \cdot e^{0,5x} \Rightarrow f'(x) = 1 \cdot e^{0,5x} + x \cdot e^{0,5x} \cdot 0,5$$

$$f'(x) = e^{0,5x}(1+0,5x)$$

$$h) f(x) = \frac{e^{3x}}{x+2} = e^{3x} \cdot (x+2)^{-1} \Rightarrow f'(x) = e^{3x} \cdot 3 \cdot (x+2)^{-1} + e^{3x} \cdot (-1)(x+2)^{-2}$$

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

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

$$f'(x) = \frac{e^{3x} \cdot (3 \cdot (x+2) - 1)}{(x+2)^2}$$

$$f'(x) = \frac{e^{3x} \cdot (3x+5)}{(x+2)^2}$$

$$l) f(x) = x \cdot e^{2x^2+1} \Rightarrow f'(x) = e^{2x^2+1} + x \cdot e^{2x^2+1} \cdot (4x)$$

$$\Rightarrow f'(x) = e^{2x^2+1} + 4x^2 \cdot e^{2x^2+1} = e^{2x^2+1} \cdot (1+4x^2)$$

$$k.) f(x) = x^2 \cdot e^{ax} \Rightarrow f'(x) = 2x \cdot e^{ax} + x^2 \cdot e^{ax} \cdot a = e^{ax} \cdot (2x+ax^2)$$

$$f'(x) = e^{ax} \cdot x \cdot (2+ax)$$