S 34 Nr. 4

a) $f(x) = x \cdot x = x^2 \Rightarrow \underline{f'(x) = 2x}$

b) $f(x) = x^5 : x = x^4 \Rightarrow \underline{f'(x) = 4x^3}$

c) $f(x) = 2(x+1) = 2x+2 \Rightarrow \underline{f'(x) = 2}$

d) $f(x) = (x+1)^2 = x^2 + 2x + 1 \Rightarrow \underline{f'(x) = 2x + 2}$

e) $f(x) = \frac{1+x}{2} = \frac{1}{2} + \frac{1}{2}x \Rightarrow \underline{f'(x) = \frac{1}{2}}$

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

g) $f(x) = a x^c \Rightarrow \underline{f'(x) = a \cdot c \cdot x^{c-1}}$

h) $f(x) = x^{2+c} + c^2 \Rightarrow \underline{f'(x)} = (2+c) \cdot x^{2+c-1} = \underline{(2+c) \cdot x^{1+c}}$

i) $f(x) = x^3 + cx \Rightarrow \underline{f'(x) = 3x^2 + c}$

S 34 Nr 5

a) $f(x) = 0,1 \cdot x^3$, $f'(x) = 0,1 \cdot 3x^2 = 0,3x^2$; $x_0 = 3$

$t(x) = f'(x_0)(x - x_0) + f(x_0) = 0,3 \cdot 3^2 \cdot (x-3) + 0,1 \cdot 3^3$

$\underline{t(x)} = 2,7 \cdot (x-3) + 2,7 = 2,7x - 8,1 + 2,7 = \underline{2,7x - 5,4}$

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b) $f(x) = \frac{2}{x}$; $f'(x) = \frac{-2}{x^2}$; $x_0 = 4$

$t(x) = f'(x_0)(x - x_0) + f(x_0) = -\frac{2}{4^2} \cdot (x-4) + \frac{2}{4} = -\frac{1}{8} \cdot (x-4) + \frac{1}{2}$

$\underline{t(x)} = -\frac{1}{8}x + \frac{1}{2} + \frac{1}{2} = \underline{-\frac{1}{8}x + 1}$

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c) $f(x) = 3x^2 - 2$; $f'(x) = 6x$, $x_0 = -1$

$t(x) = f'(x_0)(x - x_0) + f(x_0) = 6 \cdot (-1)(x - (-1)) + 3 \cdot (-1)^2 - 2$

$\underline{t(x)} = -6x - 6 + 1 = \underline{-6x - 5}$