

Nr. 4) a)  $f(x) = \cos(x) \Rightarrow f'(x) = -\sin(x) ; x_0 = 1$   
 $f'(1) = -\sin(1) = -0,8415$  (WTR)

b)  $f(x) = -\cos(x) + x^3 \Rightarrow f'(x) = \sin(x) + 3x^2$   
 $f'(2) = \sin(2) + 3 \cdot 2^2 \approx 0,9093 + 12 = 12,9093$

c)  $f(x) = -2 \cdot \sin(x) - 2x^4 \Rightarrow f'(x) = -2 \cdot \cos(x) - 8x^3$   
 $f'(3) = -2 \cdot \cos(3) - 8 \cdot 3^3 \approx +1,9800 - 216 = -214,0200$

Nr. 5)  $f(x) = \cos(x) + 5 \Rightarrow f'(x) = -\sin(x)$

$f(x) = -\cos(x) + 2\sqrt{x} \Rightarrow f'(x) = \sin(x) + \frac{1}{\sqrt{x}}$

$f(x) = \sin(x) + 3x^2 \Rightarrow f'(x) = \cos(x) + 6x$

$f(x) = \sin(x) - 2\cos(x) \Rightarrow f'(x) = \cos(x) + 2\sin(x)$

$f(x) = \cos(x) + \sin(x) \Rightarrow f'(x) = \cos(x) - \sin(x)$

Nr. 8) Parallel zur Geraden  $y = -2x + 15 \Rightarrow f'(x_0) = -2$

a)  $f(x) = 2 \cdot \sin(x) \Rightarrow f'(x) = 2 \cdot \cos(x)$

$f'(x_0) = -2 \Rightarrow 2 \cdot \cos(x_0) = -2 \quad | :2 \Rightarrow \cos(x_0) = -1$   
 $\Rightarrow x_0 = \tilde{\pi}$

b)  $f(x) = -2\cos(x) + 2 \Rightarrow f'(x) = 2\sin(x)$

$f'(x_0) = -2 \Rightarrow 2 \cdot \sin(x_0) = -2 \Rightarrow \sin(x_0) = -1 \Rightarrow x_0 = \frac{3}{2}\tilde{\pi}$

c)  $f(x) = \cos(x) - x \Rightarrow f'(x) = -\sin(x) - 1$

$f'(x_0) = -2 \Rightarrow -\sin(x_0) - 1 = -2 \quad | +1 \Rightarrow -\sin(x_0) = -1 \quad | :(-1)$

$\Rightarrow \sin(x_0) = 1 \Rightarrow x_0 = \frac{\tilde{\pi}}{2}$