

Aufgabe 5

$$f(x) = 3 - 0,5x^2$$

a)

$$t(x) = m_t \cdot x + b \quad x_0 = -2$$

$$f'(x) = -0,5 \cdot 2x = -x$$

$$f'(-2) = -(-2) = 2 = m_t$$

$$t(x) = 2x + b$$

$$f(-2) = 3 - 0,5 \cdot (-2)^2 = 1$$

$$1 = 2 \cdot (-2) + b$$

$$1 = -4 + b$$

$$b = 5$$

$$t(x) = 2x + 5$$

b)

$$t(x) = m_t \cdot x + b \quad x_0 = 0$$

$$f'(x) = -0,5 \cdot 2x = -x$$

$$f'(0) = -0 = 0 = m_t$$

$$t(x) = 0x + b$$

$$f(0) = 3 - 0,5 \cdot 0^2 = 3$$

$$3 = 0 \cdot (0) + b$$

$$b = 3$$

$$t(x) = 3$$

c)

$$t(x) = m_t \cdot x + b \quad x_0 = 5$$

$$f'(x) = -0,5 \cdot 2x = -x$$

$$f'(5) = -5 = m_t$$

$$t(x) = -5x + b$$

$$f(5) = 3 - 0,5 \cdot 5^2 = -9,5$$

$$-9,5 = -5 \cdot (5) + b$$

$$-9,5 = -25 + b$$

$$b = 15,5$$

$$t(x) = -5x + 15,5$$