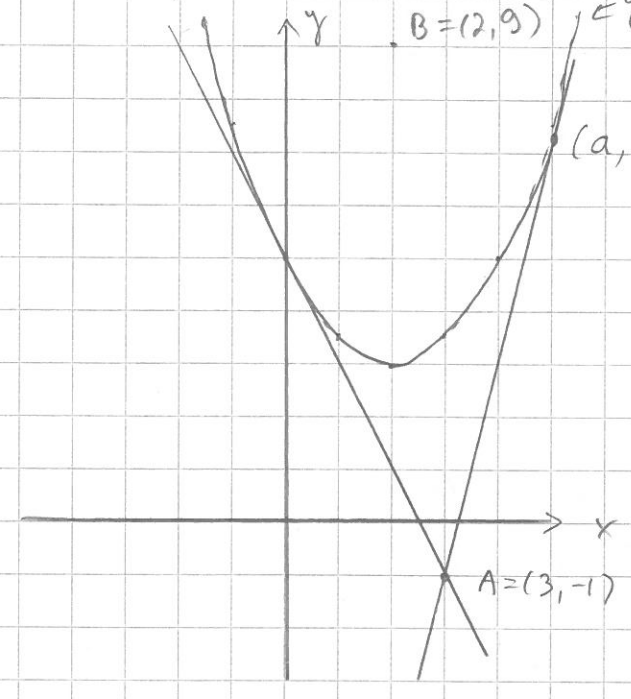
$$\Rightarrow \begin{cases} 900a + 30b = 0 \\ 225a + 15b = 10 \end{cases} \Rightarrow a = -\frac{4}{25},\ b = \frac{4}{3}$$

$$\Rightarrow y = -\frac{4}{25}x^2 + \frac{4}{3}x$$

$$\Rightarrow y' = -\frac{8}{25}x + \frac{4}{3} \quad \Rightarrow k_t = y'(0) = \frac{4}{3} = \tan\alpha$$

$$\Rightarrow \underline{\alpha \approx 53{,}1^\circ}$$

7.21 $f(x) = \frac{1}{2}x^2 - 2x + 5$ $\quad f'(x) = x - 2$



a)

$$\begin{cases} k_t = \frac{\Delta y}{\Delta x} = \frac{f(a) - (-1)}{a - 3} = \frac{\frac{1}{2}a^2 - 2a + 5 + 1}{a - 3} \\ \text{Toisaalta } k_t = f'(a) = a - 2 \end{cases}$$

$$\Rightarrow \frac{\frac{1}{2}a^2 - 2a + 6}{a - 3} = a - 2 \quad | \cdot (a-3) \neq 0$$

$$\Leftrightarrow \frac{1}{2}a^2 - 2a + 6 = (a-2)(a-3)$$

$$\Leftrightarrow \frac{1}{2}a^2 - 2a + 6 = a^2 - 3a - 2a + 6$$

$$\Leftrightarrow -\frac{1}{2}a^2 + 3a = 0$$

$$\Leftrightarrow a(-\frac{1}{2}a + 3) = 0$$

$$\Leftrightarrow a = 0 \text{ tai } -\frac{1}{2}a + 3 = 0 \Leftrightarrow a = 6$$

1° $a = 0$: $k_t = f'(0) = 0 - 2 = -2$

tangentti : $y - (-1) = -2(x - 3) \Leftrightarrow \underline{y = -2x + 5}$

2° $a = 6$: $k_t = f'(6) = 6 - 2 = 4$

tangentti : $y - (-1) = 4(x - 3) \Leftrightarrow \underline{y = 4x - 13}$

b)

$$\begin{cases} k_t = \frac{\Delta y}{\Delta x} = \frac{f(a) - 9}{a - 2} = \frac{\frac{1}{2}a^2 - 2a + 5 - 9}{a - 2} \\ k_t = f'(a) = a - 2 \end{cases}$$

$$\Rightarrow \frac{\frac{1}{2}a^2 - 2a - 4}{a - 2} = a - 2 \quad | \cdot (a-2)$$

$$\Leftrightarrow \frac{1}{2}a^2 - 2a - 4 = (a-2)^2$$

$$\Leftrightarrow \frac{1}{2}a^2 - 2a - 4 = a^2 - 2 \cdot a \cdot 2 + 2^2 \quad | \cdot 2$$

$$\Leftrightarrow a^2 - 4a + 16 = 0 \qquad D = (-4)^2 - 4 \cdot 1 \cdot 16 = -48 < 0$$

$\Rightarrow$ ei ratk.

$\Rightarrow$ pisteen $B = (2, 9)$ kautta ei voi piirtää tangenttia