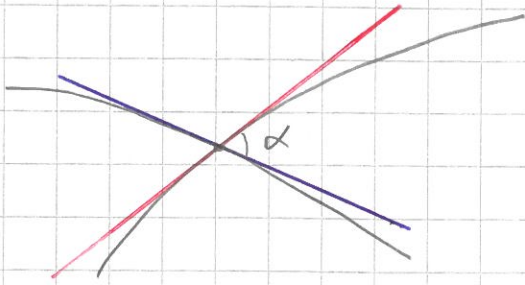


Käyrien leikkauskulma: α = leikkauspisteeseen piirrettyjen tangenttien välinen kulma



7.13 Leikkauskohdat:

$$\begin{cases} y = -\frac{1}{2}x^2 + 3 \\ y = \frac{1}{4}x^2 + \frac{3}{2}x + 3 \end{cases} \Rightarrow -\frac{1}{2}x^2 + 3 = \frac{1}{4}x^2 + \frac{3}{2}x + 3 \quad | \cdot 4$$

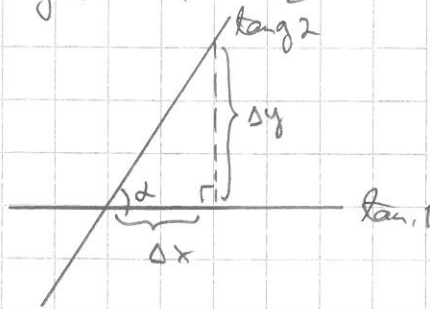
$$\Leftrightarrow -2x^2 = x^2 + 6x \Leftrightarrow -3x^2 + 6x = 0$$

$$\Leftrightarrow 3x(x - 2) = 0 \Leftrightarrow x = 0 \quad \Leftrightarrow x = 2$$

1° $x = 0$

$$f(x) = -\frac{1}{2}x^2 + 3 \Rightarrow f'(x) = -x \Rightarrow k_{t_1} = f'(0) = 0$$

$$g(x) = \frac{1}{4}x^2 + \frac{3}{2}x + 3 \Rightarrow g'(x) = \frac{1}{2}x + \frac{3}{2} \Rightarrow k_{t_2} = g'(0) = \frac{3}{2}$$



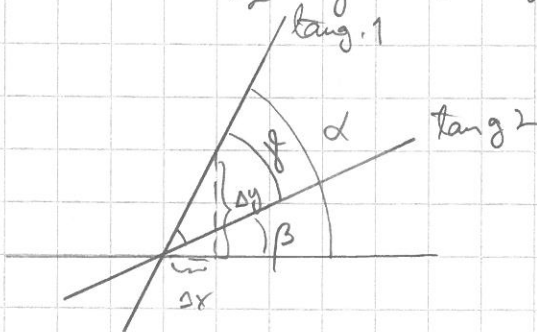
$$\tan \alpha = \frac{\Delta y}{\Delta x} = k_{t_2} = \frac{3}{2}$$

$$\Rightarrow \alpha = 56,31^\circ \approx \underline{56^\circ}$$

2° $x = -2$

$$k_{t_1} = f'(-2) = -(-2) = 2$$

$$k_{t_2} = g'(-2) = \frac{1}{2} \cdot (-2) + \frac{3}{2} = \frac{1}{2}$$



$$\tan \alpha = \frac{\Delta y}{\Delta x} = k_{t_1} = 2$$

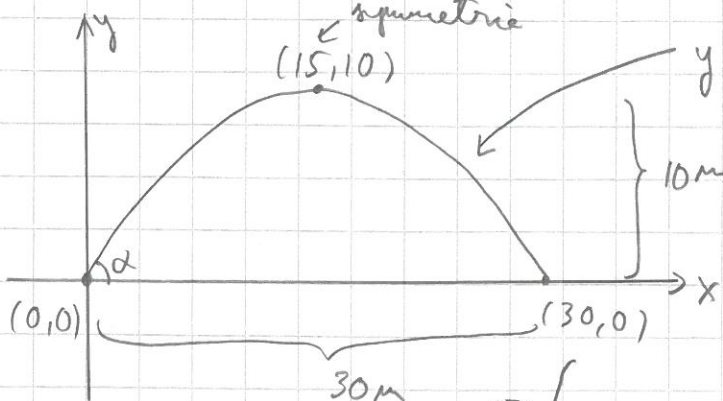
$$\Rightarrow \alpha = 63,43^\circ$$

$$\tan \beta = \frac{\Delta y}{\Delta x} = k_{t_2} = \frac{1}{2}$$

$$\Rightarrow \beta = 26,57^\circ$$

\Rightarrow leikkauskulma: $\gamma = \alpha - \beta \approx \underline{37^\circ}$

7.19



3 tuntemattomia \rightarrow tarvitaan 3 yhtälöä

$$(0,0): a \cdot 0^2 + b \cdot 0 + c = 0$$

$$(30,0): a \cdot 30^2 + b \cdot 30 + c = 0$$

$$(15,10): a \cdot 15^2 + b \cdot 15 + c = 10$$

$$c = 0$$

$$\Leftrightarrow \begin{cases} 900a + 30b + c = 0 \\ 225a + 15b + c = 10 \end{cases}$$

$$\Rightarrow a = -\frac{2}{45}, b = \frac{4}{3}$$