

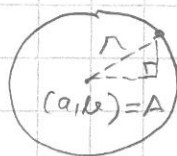
$$A = (3, 4)$$

$$a) k = \frac{\Delta y}{\Delta x} = \frac{4-0}{3-0} = \frac{4}{3}$$

$$\text{suora: } y - 4 = \frac{4}{3}(x - 3)$$

$$\Rightarrow y = \frac{4}{3}x$$

b)  $\Gamma$  ympyrä,  $z_p = (a, b)$ , säde:  $r$



$$(x, y) = P \quad |AP| = r$$

$$\sqrt{(x-a)^2 + (y-b)^2} = r \quad |()^2$$

$$\Rightarrow (x-a)^2 + (y-b)^2 = r^2$$

$$r = |OA| = \sqrt{(3-0)^2 + (4-0)^2} = 5 \Rightarrow \text{ympyrä: } (x-0)^2 + (y-0)^2 = 5^2$$

$$\Rightarrow x^2 + y^2 = 25$$

c)  $y = ax^2 + bx + c$

$$A = (3, 4) : \begin{cases} a \cdot 3^2 + b \cdot 3 + c = 4 \\ a \cdot 0^2 + b \cdot 0 + c = 0 \\ a \cdot (-3)^2 + b \cdot (-3) + c = 4 \end{cases}$$

$$O = (0, 0) : \begin{cases} a \cdot 0^2 + b \cdot 0 + c = 0 \\ a \cdot (-3)^2 + b \cdot (-3) + c = 4 \end{cases}$$

$$(-3, 4) : \begin{cases} a \cdot (-3)^2 + b \cdot (-3) + c = 4 \\ a \cdot 0^2 + b \cdot 0 + c = 0 \end{cases}$$

$$\Rightarrow a = \frac{4}{9}, b = c = 0$$

$\Gamma_{TAI}$ :  $y = ax^2 + bx + c$

- kulkee origon kautta :  $c = 0$

- symmetrisen y- akselin suhteen  $\rightarrow$  parabolinen  
 $\rightarrow$  eksponentiaalinen on parabolinen  $\rightarrow b = 0$

$$\Rightarrow y = ax^2$$

$$A = (3, 4) : 4 = a \cdot 3^2 \Leftrightarrow a = \frac{4}{9} \Rightarrow y = \frac{4}{9}x^2$$

TAI: Geogebra

9.7

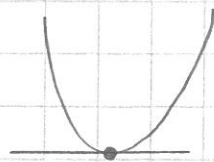
$$y = 2x^2 + bx + 3$$

$$y' = 4x + b = 0 \Rightarrow x = -\frac{b}{4}$$

$$y\left(-\frac{b}{4}\right) = 2\left(-\frac{b}{4}\right)^2 + b \cdot \left(-\frac{b}{4}\right) + 3 = 2 \cdot \frac{b^2}{16} - \frac{b^2}{4} + 3 = \frac{b^2}{8} - \frac{2b^2}{8} + 3 = -\frac{b^2}{8} + 3$$

$$\Rightarrow \text{huippu: } \left( \underbrace{-\frac{b}{4}}_x, \underbrace{-\frac{b^2}{8} + 3}_y \right)$$

$$\begin{cases} x = -\frac{b}{4} & (\Rightarrow) b = -4x \\ y = -\frac{b^2}{8} + 3 & \leftarrow \text{m} \end{cases} \Rightarrow y = -\frac{(-4x)^2}{8} + 3 = -\frac{16x^2}{8} + 3 = -2x^2 + 3$$



$$\left( -\frac{b}{4}, -\frac{b^2}{8} + 3 \right)$$

huippu on karppiolla  $y = -2x^2 + 3$