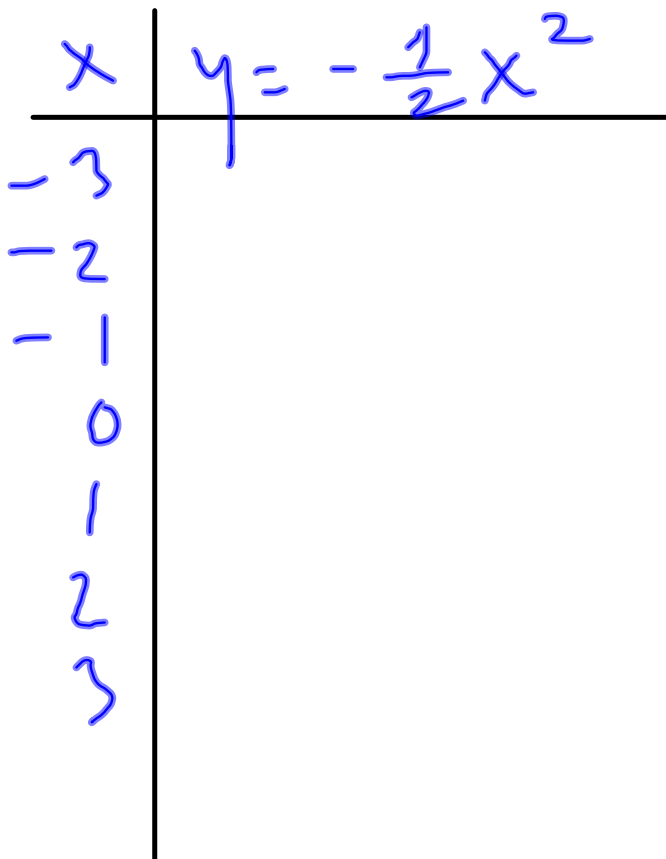


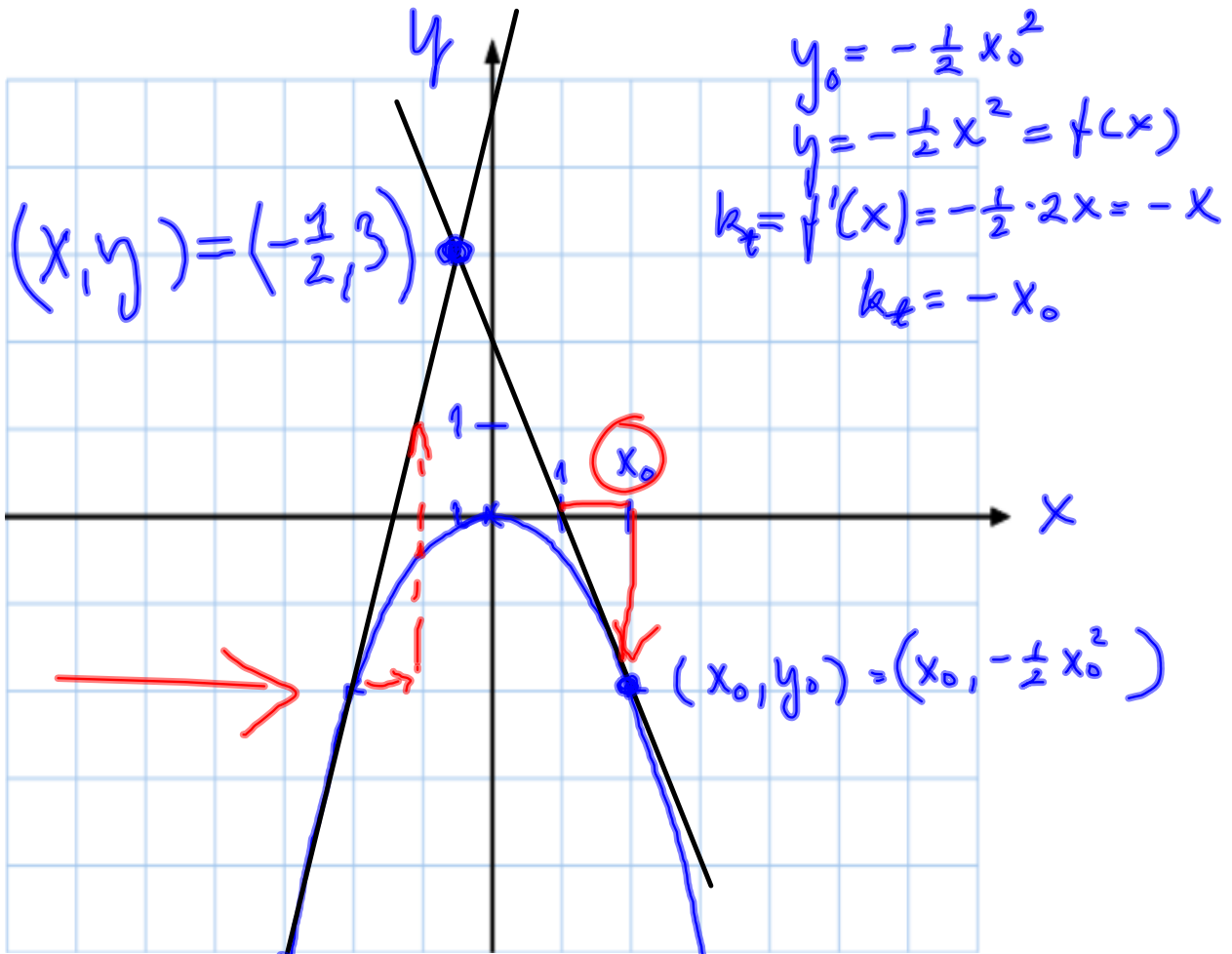
Tangentin määrittäminen  
piste käyrän ulkopuolella

oim

$$y = -\frac{1}{2}x^2$$

$(-\frac{1}{2}, 3)$  pisteeseen tangenttien  
yhtälöt





Olk.  $x_0$  tangentin  
 sivuamiskohta

$y$ -koordinaatti

$$f'(x) =$$

tangentin yhtälö:

$$y - y_0 = k(x - x_0)$$

$$y + \frac{1}{2}x_0^2 = -x_0(x - x_0)$$

$$y = -x_0x + x_0^2 - \frac{1}{2}x_0^2$$

$$y = -x_0x + \frac{1}{2}x_0^2$$

hijoitetun piste  $(-\frac{1}{2}, 3)$

$$3 = -x_0(-\frac{1}{2}) + \frac{1}{2}x_0^2$$

$$\frac{1}{2}x_0^2 + \frac{1}{2}x_0 - 3 = 0 \quad | \cdot 2$$

$$x_0^2 + x_0 - 6 = 0$$

kaava

sij.

$$x_0 = -3 \text{ tai } x_0 = 2$$

$$y: \text{ sij. } y_0 = -\frac{1}{2}x_0^2$$

$$y_0 = -4\frac{1}{2} \text{ tai } y_0 = -2$$

$$k = -x_0 \quad \text{sij. } x_0 = -3:$$

$$k = 3$$

$$\text{sij. } x_0 = 2:$$

$$k = -2$$

$$(-3, -4\frac{1}{2})$$

$$(2, -2)$$

$$y - y_0 = k(x - x_0)$$

$$y = 3x + \frac{9}{2} \text{ tai } y = -2x + 2$$
$$= 0 \text{ tai } = 0$$

$$y - y_{\infty} = k(x - x_0)$$

$$y - (-2) = -2(x - 2)$$

$$y + 2 = -2x + 4$$

$$y = -2x + 2$$