

Exp_log

4.2.7 SUBSTITUTION

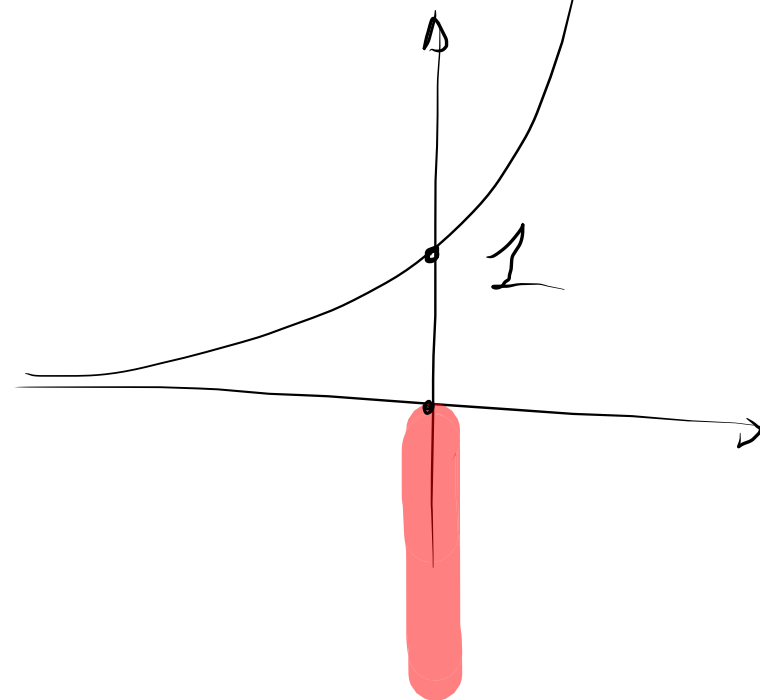
ED_f

$$ED(e^x) = \mathbb{R}$$

$$e^x: \mathbb{R} \rightarrow]0; +\infty[$$

Example: a) $f(x) = e^{(2x^2 + 3x + 2)}$

$$ED_f = \mathbb{R}$$

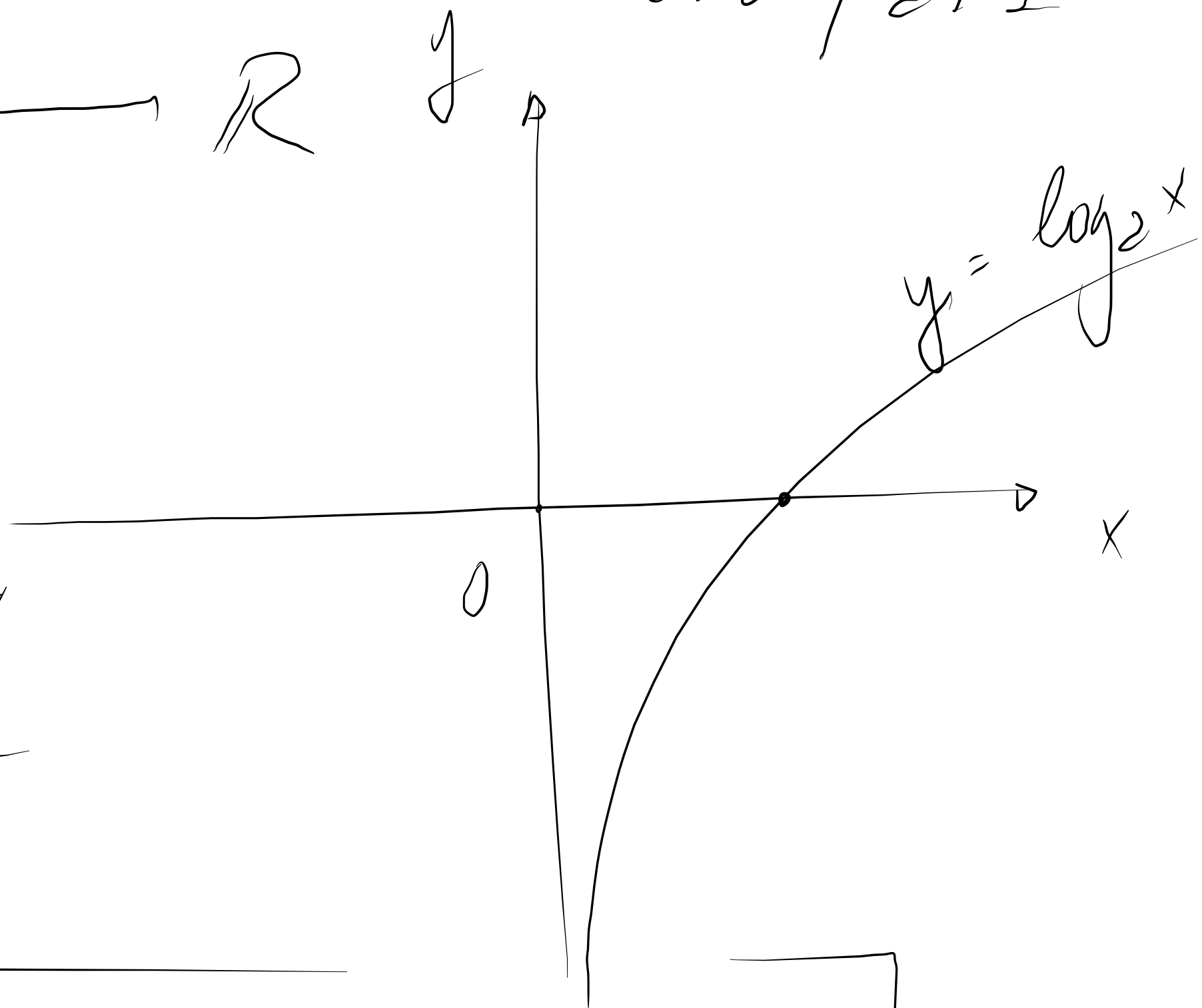


b) $f(x) = 2^{\sqrt{x}}$ $ED_f = [0; +\infty[$
(\sqrt{x})

c) $f(x) = 3^{\frac{1}{x-1}}$ $ED_f = \mathbb{R} - \{1\}$

$$\log_2 : \underbrace{]0, +\infty[}_{\mathbb{R}_+^*} \longrightarrow \mathbb{R} \quad \text{2} > 0 \quad / \quad 2 \neq 1$$

$$ED(\log_2) = \mathbb{R}_+^*$$



$$f(x) = \log_2(x) \quad ED_f = \mathbb{R}_+^*$$

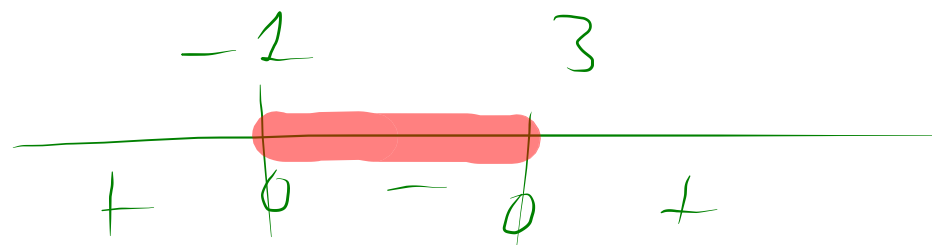
Example:

$$a) \text{ED} \left(\log_2 \left(\frac{1}{x} \right) \right) = \mathbb{R}_+^*$$

$$(x-3)(x+1)$$

$$x = \frac{2 \pm \sqrt{16}}{2}$$

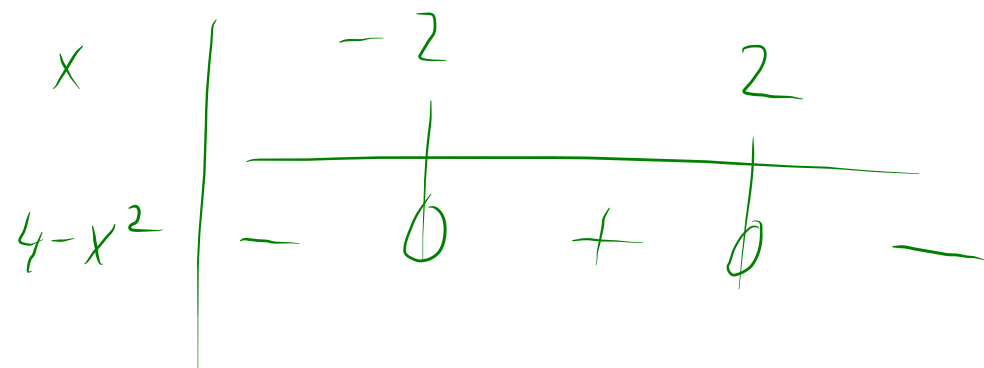
$$b) f(x) = \log(x^2 - 2x - 3)$$



$$= \begin{cases} 3 \\ -1 \end{cases}$$

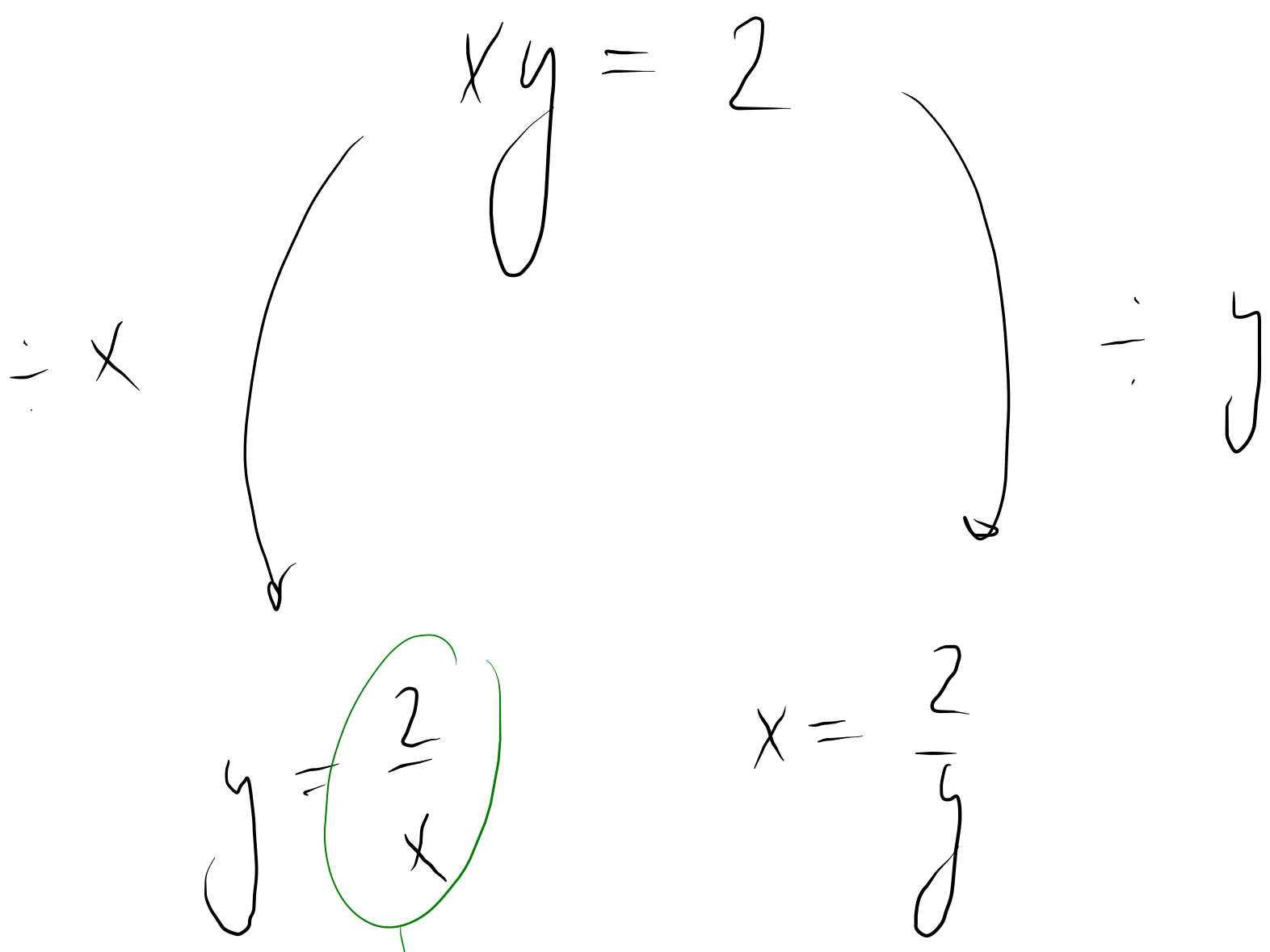
$$\text{ED}_f = \mathbb{R} - [-1; 3]$$

$$c) f(x) = \ln(4 - x^2)$$



$$\text{ED}_f =]-2; 2[$$

$$f(0) = \ln(4)$$



$$\log(x) - \log(y) = 1$$

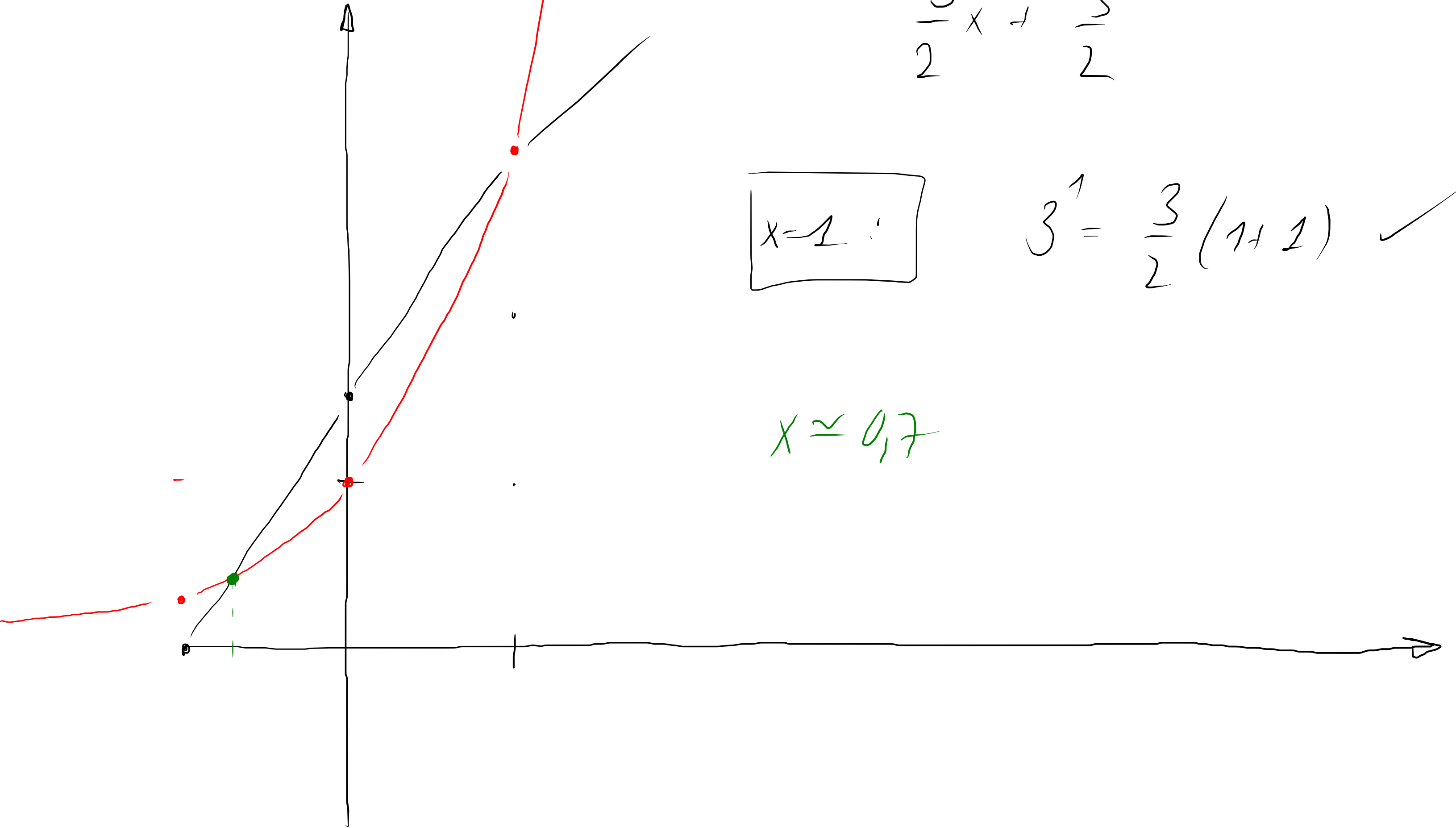
$$3^x = \frac{3}{2}(x+1)$$

$$\frac{3}{2}x + \frac{3}{2}$$

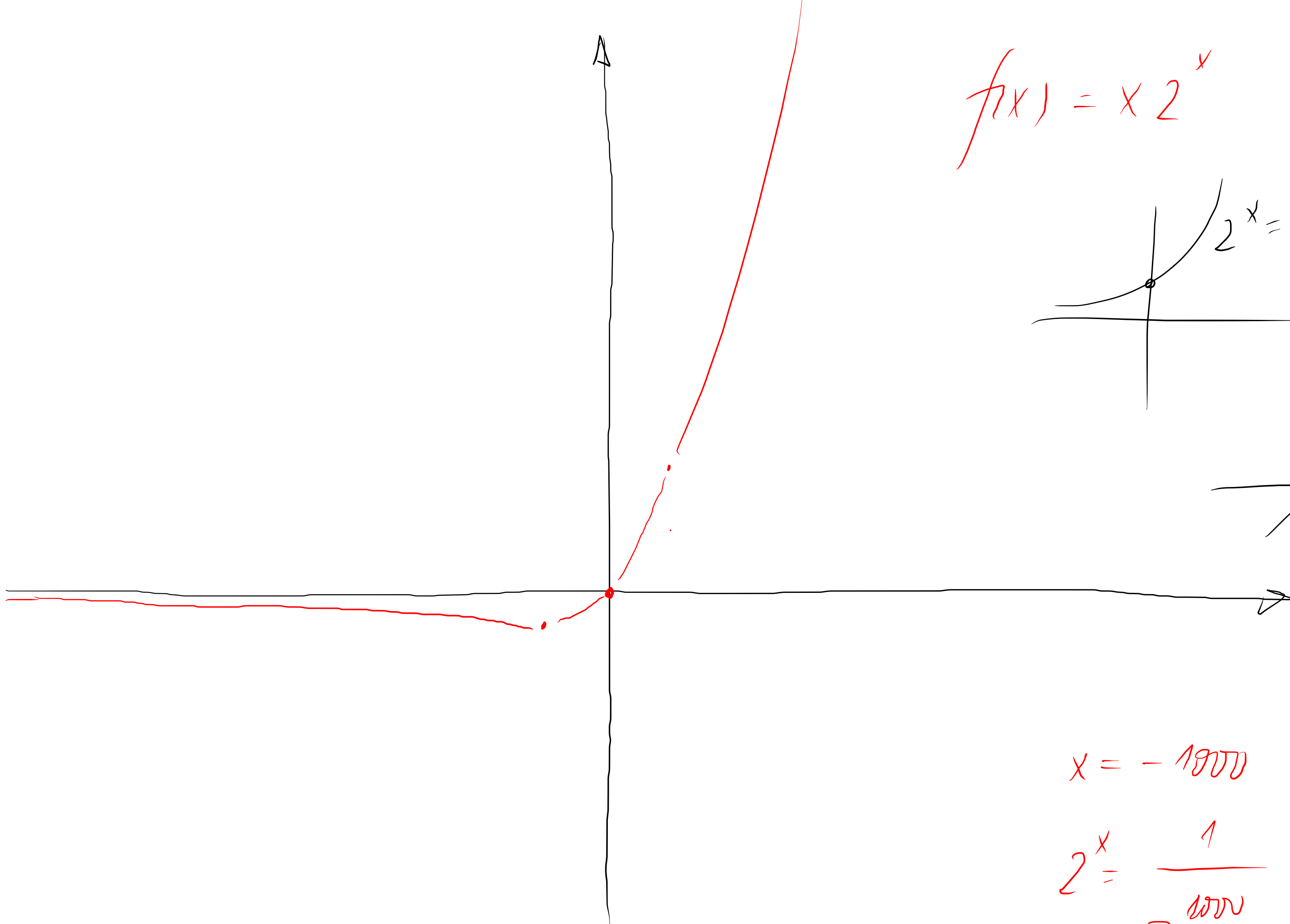
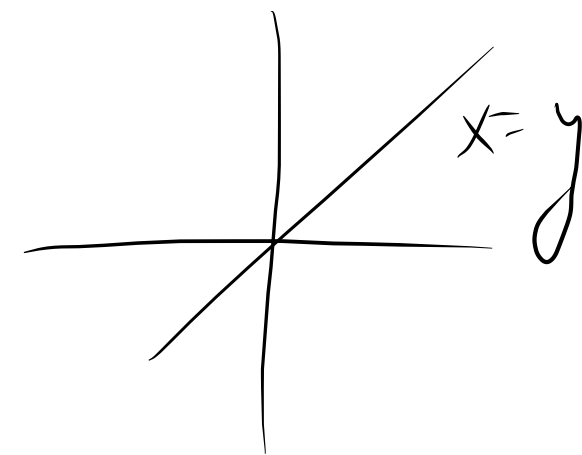
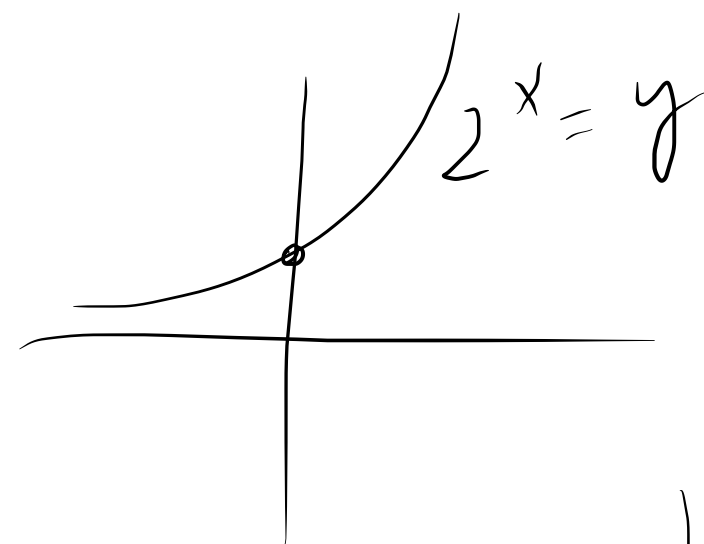
$$x = -1$$

$$3^1 = \frac{3}{2}(1+1) \quad \checkmark$$

$$x \approx 0,7$$



$$f(x) = x 2^x$$



$$x = -1000$$

$$2^x = \frac{1}{2^{1000}}$$

$$\log(xy) = \log(x) + \log(y)$$

$$\log(x^r) = r \log(x)$$

$$\log(15) = \log(3 \cdot 5) = \log(3) + \log(5)$$

$$2 \log(50) + 3 \log(10) - \log(25) - 2 \log(10) =$$

$$\log(50^2) + \log(10^3) - \log(25) - \log(10^2) =$$

$$\log\left(\frac{\cancel{2500} \cdot 1000}{\cancel{25} \cdot \cancel{100}}\right) = 4 = \log_{10}(10^4)$$