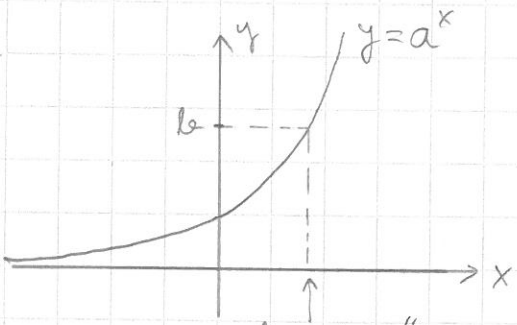


$$2^x = 3 \Leftrightarrow x = \log_2 3 \approx 1,585$$

$(= \frac{\log 3}{\log 2})$
 "2-kantainen logaritmi luvusta 3"

c) $\underbrace{2^x = -1}_{> 0 \text{ aina}}$ ei ratk.

Yleisesti



$a^x = b \Leftrightarrow x = \log_a b$

$a > 0, a \neq 1,$
 $b > 0$
 logaritmin kantaluken

$\log_a b$ "a-kantainen logaritmi luvusta b"

Esim.

- a) $5^x = 7 \Leftrightarrow x = \log_5 7 \approx 1,209$
- b) $\log_2 8 = 3 \quad (2^3 = 8)$
- c) $\log_3 9 = 2 \quad (3^2 = 9)$
- d) $\log_5 1 = 0 \quad (5^0 = 1)$
- e) $\log_2 \frac{1}{4} = -2 \quad (2^{-2} = \frac{1}{2^2} = \frac{1}{4})$
- f) $\log_3 0$ ei määritetty koska $3^x > 0$ aina

$$a^{\log_a b} = a^x = b$$

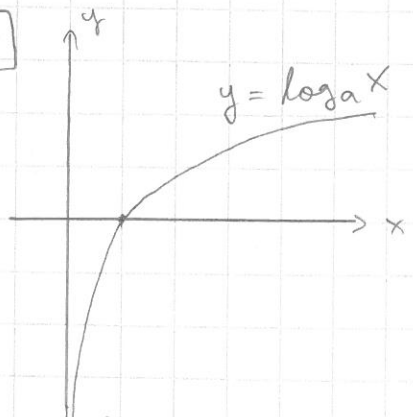
$$\log_a a^b = b$$

$$(x = \log_a b \Leftrightarrow a^x = b)$$

$$a^{\log_a b} = b$$

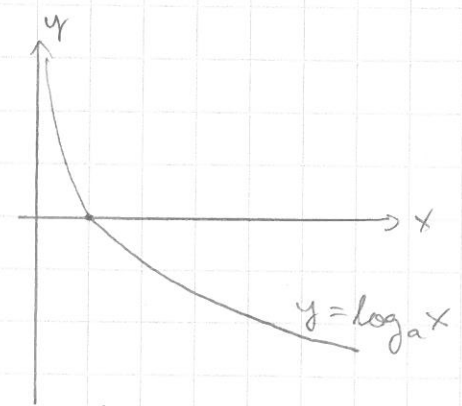
$$\log_a a^b = b$$

1° $a > 1$



aidosti kasvava funktio

2° $0 < a < 1$



aidosti vähenevä funktio