JUURIYHTÄLÖ JA -EPÄYHTÄLÖT

Olk. $a, b \geq 0$

$a = b \quad |(\,)^2$

$a^2 = b^2$

$a < b \iff a^2 < b^2$

esim $-5 = 5 \quad |(\,)^2$ epätosi

$25 = 25$ tosi

esim a) $\sqrt{x+3} = 5$

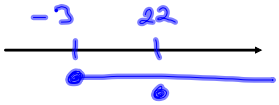
1. tapa määrittely, kun $x+3 \geq 0$, $x \geq -3$

$\sqrt{x+3} = 5 \quad |(\,)^2$

$x+3 = 25$

$x = 22$

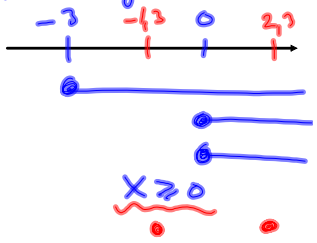
$\in$ mj



$\mathbb{V}: x = 22$

b) $\sqrt{x+3} = x \quad |(\,)^2$ mj: $x+3 \geq 0$ ja $x \geq 0$

$x \geq -3$ ja $x \geq 0$



$x+3 = x^2$

$x^2 - x - 3 = 0$

laava

kj.

$x = \frac{1 \pm \sqrt{13}}{2} =$

$x = \frac{1+\sqrt{13}}{2} \approx 2{,}3 \in$ mj $\quad x = \frac{1-\sqrt{13}}{2} = -1{,}3 \notin$ mj

$\mathbb{V}: x = \frac{1+\sqrt{13}}{2}$

a) 2. tapa $\sqrt{x+3} = 5 \quad |(\,)^2$

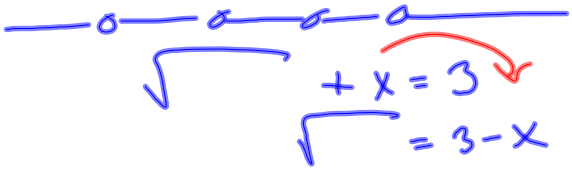
$\vdots$

$x = 22$

sijoitet. alkuper. yhtälöön

$\sqrt{22+3} = 5$

$5 = 5 \Rightarrow$ tosi

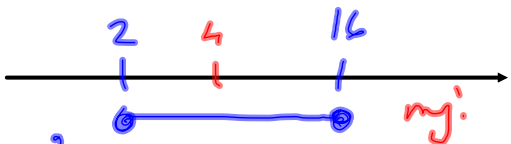


zad 3 $\sqrt{x-2} \leq 16-x \quad |(\ )^2$

mj: $x-2 \geqslant 0$ **i** $16-x \geqslant 0$

$x \geqslant 2$ **i** $16 \geqslant x$

$x \leqslant 16$



$x-2 \leq (16-x)^2$

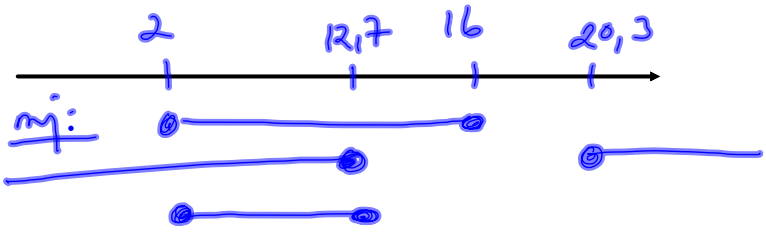
$\vdots$

$x^2-33x+258 \geqslant 0$

metoda. $x^2-33x+258=0$

$x = 20{,}3$ **lub** $x = 12{,}7$

$x \leq 12{,}7$ **lub** $x \geqslant 20{,}3$



V: $2 \leq x \leq 12{,}7$