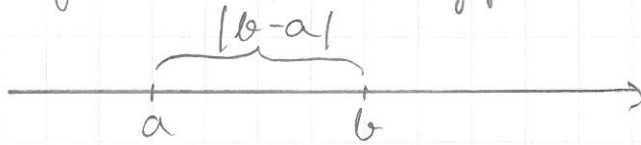


1. Itseisarvo

 Lukujen a ja b välinen etäisyys: $|b-a|$


$$|a| = \begin{cases} a, & a \geq 0 \\ -a, & a < 0 \end{cases}$$

ITSEISARVO

 Esim. Laske lukujen a) -5 ja 3 , b) $-3\sqrt{3}+2$ ja $1-\sqrt{3}$ välinen etäisyys.

Ratk. a) $|-5-3| = |-8| = 8$

b) $|(-3\sqrt{3}+2) - (1-\sqrt{3})| = |-3\sqrt{3}+2-1+\sqrt{3}| = |1-2\sqrt{3}|$
 $= -(1-2\sqrt{3}) = -1+2\sqrt{3} = \underline{2\sqrt{3}-1}$

Ominaisuuksia:

$$\begin{cases} |a| \geq 0 \\ |a| = |-a| \\ |ab| = |a||b| \\ \left| \frac{a}{b} \right| = \frac{|a|}{|b|} \quad (b \neq 0) \end{cases}$$

1.6 $|x-2| + |x|$

a) $x > 2$: $\underbrace{|x-2|}_{>0} + \underbrace{|x|}_{>0} = (x-2) + x = 2x-2$

b) $x < 0$: $\underbrace{|x-2|}_{<0} + \underbrace{|x|}_{<0} = -(x-2) + (-x) = -x+2-x = 2-2x$

c) $0 \leq x < 2$: $\underbrace{|x-2|}_{<0} + \underbrace{|x|}_{\geq 0} = -(x-2) + x = -x+2+x = 2$

1.11 a) $\underbrace{|\sqrt{5}-2|}_{>0} = \sqrt{5}-2$

b) $\underbrace{|-3-\sqrt{2}|}_{<0} = -(-3-\sqrt{2}) = 3+\sqrt{2}$

c) $\underbrace{|1+\sqrt{2}-\sqrt{3}|}_{>0} = 1+\sqrt{2}-\sqrt{3}$