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Apsolutna vrijednost realnog broja

Udaljenost točaka na brojevnom pravcu

Jednadžbe i nejednadžbe s apsolutnim vrijednostima

str. 172

1/1

$$\frac{a|b| - b|a|}{|a| - |b|} = \frac{-2|-3| - (-3)|-2|}{|-2| - |-3|}$$

$$= \frac{-6 + 6}{2 - 3}$$

$a = -2$

$b = -3$

$$= \frac{0}{-1}$$

1/3

$$\frac{a|b| - b|a|}{|a| - |b|} = \frac{(1-\sqrt{2}) \cdot |1+\sqrt{2}| - (1+\sqrt{2}) \cdot |1-\sqrt{2}|}{|1-\sqrt{2}| - |1+\sqrt{2}|}$$

$a = 1 - \sqrt{2}$

$b = 1 + \sqrt{2}$

$$= \frac{-1 - 1}{-2}$$

$$= \frac{-2}{-2}$$

$$= 1$$

2/1

$$\frac{a|a-b|-b|a+b|}{|a-b|-|a+b|} = \frac{-1|-1-(-3)|-(-3)|-1+(-3)|}{|-1-(-3)|-|-1+(-3)|}$$

$a=-1$

$b=-3$

$$= \frac{-2+12}{2-4}$$

$$= \frac{10}{-2}$$

$$= -5$$

2/3

$$\frac{a|a-b|-b|a+b|}{|a-b|-|a+b|} = \frac{\sqrt{2}|\sqrt{2}-(-\sqrt{3})|-(-\sqrt{3})|\sqrt{2}+(-\sqrt{3})|}{|\sqrt{2}-(-\sqrt{3})|-|\sqrt{2}+(-\sqrt{3})|}$$

$a=\sqrt{2}$

$b=-\sqrt{3}$

$$= \frac{2+\sqrt{6}+3-\sqrt{6}}{\sqrt{2}+\sqrt{3}-\sqrt{3}+\sqrt{2}}$$

$$= \frac{5}{2\sqrt{2}} \Big/ \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

racionalizacija nazivnika

$$\frac{5\cdot\sqrt{2}}{2\sqrt{2}\cdot\sqrt{2}} = \frac{5\sqrt{2}}{2\cdot(\sqrt{2})^2} = \frac{5\sqrt{2}}{4}$$

$$= \frac{5\sqrt{2}}{4}$$

str. 172

5/1

$$\sqrt{(\sqrt{2}-\sqrt{3})^2} - \sqrt{(\sqrt{3}-\sqrt{2})^2}$$

$$|\sqrt{2}-\sqrt{3}| - |\sqrt{3}-\sqrt{2}|$$

$$-(\sqrt{2}-\sqrt{3})-(\sqrt{3}-\sqrt{2})$$

$$0$$

5/2

$$\sqrt{(1-\sqrt{2})^2} - \sqrt{(\sqrt{2}-\sqrt{3})^2} - \sqrt{(\sqrt{3}-2)^2}$$

$$|1-\sqrt{2}| - |\sqrt{2}-\sqrt{3}| - |\sqrt{3}-2|$$

$$\sqrt{2}-1-(\sqrt{3}-\sqrt{2})-(2-\sqrt{3})$$

$$\sqrt{2}-1-\sqrt{3}+\sqrt{2}-2+\sqrt{3}$$

$$2\sqrt{2}-3$$

6/1

$x = 1 - \sqrt{2}$

$$\left| |x| - 1 \right|$$

$$\left| |1-\sqrt{2}| - 1 \right|$$

$$\left| \sqrt{2} - 2 \right|$$

$$2 - \sqrt{2}$$

6/2

$x = \sqrt{2}$

$$\left| |x-2| - \sqrt{2} \right|$$

$$\left| |\sqrt{2}-2| - \sqrt{2} \right|$$

$$\left| 2 - \sqrt{2} - \sqrt{2} \right|$$

$$2\sqrt{2} - 2$$

6/5

$x = \sqrt{3}$

$$|x-3| - |x-2| - |x-1|$$

$$|\sqrt{3}-3| - |\sqrt{3}-2| - |\sqrt{3}-1|$$

$$3 - \sqrt{3} - (2 - \sqrt{3}) - (\sqrt{3} - 1)$$

$$3 - \sqrt{3} - 2 + \sqrt{3} - \sqrt{3} + 1$$

$$2 - \sqrt{3}$$

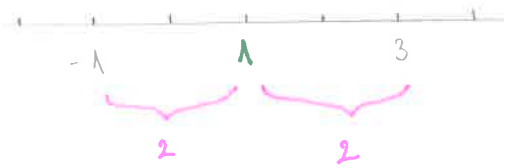
Str. 179

5/1

$|x-1| = 2$

$\downarrow$

1

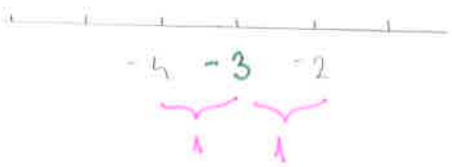


5/2

$|x+3| = 1$

$\downarrow$

-3

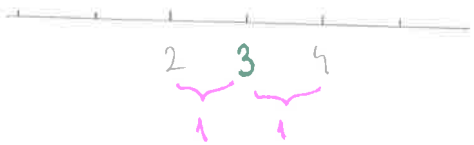


5/4

$|x-3| = 1$

$\downarrow$

3

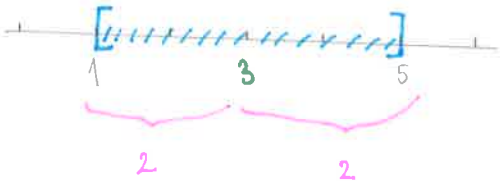


6/1

$|x-3| \leq 2$

$\downarrow$

3

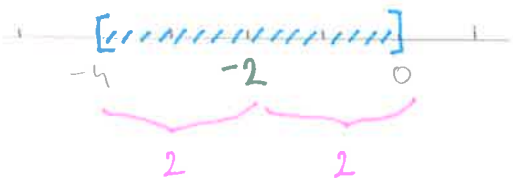


6/3

$|x+2| \leq 2$

$\downarrow$

-2

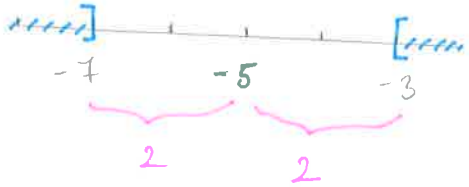


6/4

$|x+5| \geq 2$

$\downarrow$

-5



str. 180

Pr.1.

$$|2x+3| = 6$$

$2x+3=6$

$2x=3$

$\boxed{x=\frac{3}{2}}$

$2x+3=-6$

$2x=-9$

$\boxed{x=-\frac{9}{2}}$

1/2

$$|3x-1| = 5$$

$3x-1=5$

$3x=6$

$\boxed{x=2}$

$3x-1=-5$

$3x=-4$

$\boxed{x=-\frac{4}{3}}$

1/3

$|x+7| = -1$ X

↑ ne smije biti negativan

Pr.2. (nema u udžbeniku)

$$\big||x-1|-2\big| = 3$$

$|x-1|-2=-3$

$|x-1| = -1$ X

↑ ne smije biti negativan

$|x-1|-2=3$

$|x-1| = 5$

$x-1=5$

$\boxed{x=6}$

$x-1=-5$

$\boxed{x=-4}$

str. 181

3/2

$||x+1|-3| = 2$

$|x+1|-3 = 2$

$|x+1| = 5$

$x+1 = 5$ → $x = 4$

$x+1 = -5$ → $x = -6$

$|x+1|-3 = -2$

$|x+1| = 1$

$x+1 = 1$ → $x = 0$

$x+1 = -1$ → $x = -2$

str. 185

7/5

$||x-1|-2| = 3$

$|x-1|-2 = 3$

$|x-1| = 5$

$x-1 = 5$ → $x = 6$

$x-1 = -5$ → $x = -4$

$|x-1|-2 = -3$

$|x-1| = -1$ ✗

7/7

$||2x+1|-3| = 2$

$|2x+1|-3 = 2$

$|2x+1| = 5$

$2x+1 = 5$

$2x = 4$

$x = 2$

$2x+1 = -5$

$2x = -6$

$x = -3$

$|2x+1|-3 = -2$

$|2x+1| = 1$

$2x+1 = 1$

$2x = 0$

$x = 0$

$2x+1 = -1$

$2x = -2$

$x = -1$

str. 181

pr. 3. (nema u udžbeniku)

$|2x-3| = |x+1|$



$2x-3 = x+1$

$x = 4$

$2x-3 = -x-1$

$3x = 2$

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

5/3

$|4x+5| = |2x-3|$

$4x+5 = 2x-3$

$2x = -8$

$x = -4$

$4x+5 = -2x+3$

$6x = -2$

$x = -\frac{1}{3}$

5/5

$|2x-5| = |3x-5|$

$2x-5 = 3x-5$

$-x = 0$

$x = 0$

$2x-5 = -3x+5$

$5x = 10$

$x = 2$

pr. 4. (nema u udžbeniku)

$|2x+3| \geq 5$

$2x+3 \geq 5$

$2x \geq 2$

$x \geq 1$

$2x+3 \leq -5$

$2x \leq -8$

$x \leq -4$

$x \in \langle -\infty, -4] \cup [1, +\infty \rangle$

str. 185

14/1

$|x-1| \leq 2$

$x-1 \leq 2$

$x \leq 3$

$x-1 \geq -2$

$x \geq -1$

$x \in \langle -\infty, -1] \cup [3, +\infty \rangle$

pr. 5 (nema u udžbeniku)

$|2x-1| < 3$

$2x-1 < 3$

$2x-1 > -3$

$-3 < 2x-1 < 3 \quad / +1$

$-2 < 2x < 4 \quad / : 2$

$-1 < x < 2$

$x \in \langle -1, 2 \rangle$

$|3x-9| \geq 3$

$3x-9 \geq 3$

$3x \geq 12$

$x \geq 4$

$3x-9 \leq -3$

$3x \leq 6$

$x \leq 2$

$x \in \langle -\infty, 2] \cup [4, +\infty \rangle$

$|4-2x| > 3$

$4-2x > 3$

$-2x > -1 \;/:(-2)$

$x < \frac{1}{2}$

$4-2x < -3$

$-2x < -7 \;/:(-2)$

$x > \frac{7}{2}$

$x \in \langle -\infty, \frac{1}{2} \rangle \cup \langle \frac{7}{2}, +\infty \rangle$

$|6x-4| < 2$

$6x-4 < 2$

$6x-4 > -2$

$-2 < 6x-4 < 2 \;/+4$

$2 < 6x < 6 \;/:6$

$x \in \langle \frac{1}{3}, 1 \rangle$

$\frac{1}{3} < x < 1$

$$|2x-6| = x+3$$

$2x-6>0$

$2x>6$

$x>3$

$x \geq 3$

$2x-6 = x+3$

$x = 9$

$x < 3$

$2x-6 = -x-3$

$3x = 3$

$x = 1$

$$|3x+9| = 3-x$$

$3x+9<0$

$3x<-9$

$x<-3$

$x \leq -3$

$3x+9 = 3-x$

$4x = -6$

$x = -\frac{6}{4}$

$x = -\frac{3}{2}$

$x > -3$

$3x+9 = x-3$

$2x = -12$

$x = -6$

$$|6x-2| \leq 3$$

$6x-2 \leq 3$

$6x-2 \geq -3$

$-3 \leq 6x-2 \leq 3 \quad /+2$

$-1 \leq 6x \leq 5 \quad /:6$

$-\frac{1}{6} \leq x \leq \frac{5}{6}$

$x \in \left[-\frac{1}{6}, \frac{5}{6}\right]$

str. 185

14/2

$|x-1| > 1$

$x-1 > 1$ $\qquad$ $x-1 \leq -1$

$1 < x-1 < -1 \,/ +1$

$2 < x < 0$

$x \in \langle 2, 0 \rangle$

14/4

$|x+2| \geq 1$

$x+2 \geq 1$ $\qquad$ $x+2 \leq -1$

$x \geq -1$ $\qquad$ $x \leq -3$

$x \in \langle -\infty, -3] \cup [-1, +\infty \rangle$