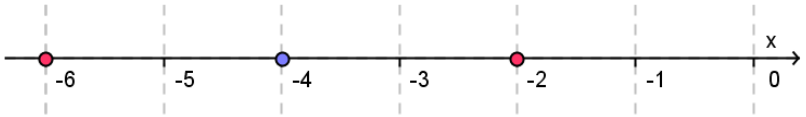
Ponavljanje za pismeni ispit – jednadžbe i nejednadžbe s apsolutnim vrijednostima

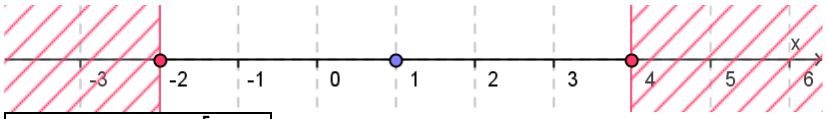
1. Grafički riješi jednadžbu $|x+4|=2$.

$|x-(-4)|=2$



$\boxed{x_1=-6}$ $\boxed{x_2=-2}$

2. Grafički riješi nejednadžbu $|x-1|\geq 3$.



$\boxed{x\in\langle-\infty,-2]\cup[4,\infty\rangle}$

3. Riješi jednadžbu $\left|\frac{1}{3}x+5\right|=\frac{2}{5}$.

$\frac{1}{3}x+5=-\frac{2}{5}\quad /\cdot 15$

$5x+75=-6$

$5x=-6-75$

$5x=-81$

$\boxed{x_1=-\frac{81}{5}}$

$\frac{1}{3}x+5=\frac{2}{5}\quad /\cdot 15$

$5x+75=6$

$5x=6-75$

$5x=-69$

$\boxed{x_2=-\frac{69}{5}}$

4. Riješi nejednadžbu $|6-5x|<3$.

$-3<6-5x<3$

$-3-6<-5x<3-6$

$-9<-5x<-3\quad /:(-5)$

$\frac{9}{5}>x>\frac{3}{5}$

$\boxed{x\in\left\langle\frac{3}{5},\frac{9}{5}\right\rangle}$

5. Riješi jednadžbu $|-x-2|=2x-1$.

$-x-2<0$

$-x<2$

$x>-2$

$x+2=2x-1$

$x-2x=-1-2$

$-x=-3$

$\boxed{x_1=3}$

$-x-2\geq 0$

$-x\geq 2$

$x\leq -2$

$-x-2=2x-1$

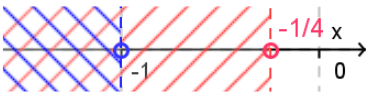
$-x-2x=-1+2$

$-3x=1$

$x_2=-\frac{1}{3}$ ne prihvaćamo

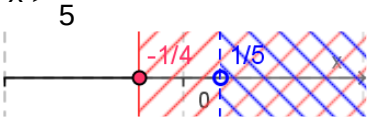
6. Riješi nejednadžbu $|4x+1| > -x+2$.

$4x+1<0$
$4x<-1$
$x<-\frac{1}{4}$
$-4x-1>-x+2$
$-4x+x>2+1$
$-3x>3$
$x<-1$



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

$4x+1\geq 0$
$4x\geq -1$
$x\geq -\frac{1}{4}$
$4x+1>-x+2$
$4x+x>2-1$
$5x>1$
$x>\frac{1}{5}$



$x\in\left\langle\frac{1}{5},\infty\right\rangle$

$$\boxed{x\in\langle-\infty,-1\rangle\cup\left\langle\frac{1}{5},\infty\right\rangle}$$

7. Riješi jednadžbu $|2x-3|-|x+1|=5x-10$.

$2x-3=0$ $\quad$ $x+1=0$
$2x=3$ $\quad$ $x=-1$
$x=\frac{3}{2}$

	$-\infty$		-1		$\frac{3}{2}$		∞
	|		|		|		|
$2x-3$	|	$-$	|	$-$	0	$+$	|
$x+1$	|	$-$	0	$+$	|	$+$	|

$x\in\langle-\infty,-1]$
$-2x+3-(-x-1)=5x-10$
$-2x+3+x+1=5x-10$
$-2x+x-5x=-10-3-1$
$-6x=-14$
$x=\frac{14}{6}$
$x_1=\frac{7}{3}$ ne prihvaćamo

$x\in\left\langle-1,\frac{3}{2}\right]$
$-2x+3-(x+1)=5x-10$
$-2x+3-x-1=5x-10$
$-2x-x-5x=-10-3+1$
$-8x=-12$
$x=\frac{12}{8}$
$\boxed{x_2=\frac{3}{2}}$

$x\in\left\langle\frac{3}{2},\infty\right\rangle$
$2x-3-(x+1)=5x-10$
$2x-3-x-1=5x-10$
$2x-x-5x=-10+3+1$
$-4x=-6$
$x=\frac{6}{4}$
$x_3=\frac{3}{2}$ ne prihvaćamo

8. Riješi nejednadžbu $2|x| \le |x+1|$.

$x = 0$ $\qquad$ $x+1=0$

$x=-1$

	$-\infty$		-1		0		∞
	|		|		|	|
x	|	$-$	|	$-$	0	$+$	|
$x+1$	|	$-$	0	$+$	|	$+$	|

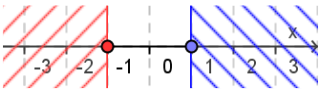
$x \in \langle -\infty, -1]$

$2(-x) \le -x-1$

$-2x+x \le -1$

$-x \le -1$

$x \ge 1$



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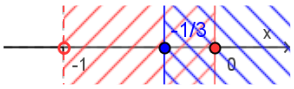
$x \in \langle -1, 0]$

$2(-x) \le x+1$

$-2x-x \le 1$

$-3x \le 1$

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



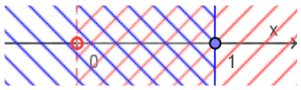
$x \in \left[-\frac{1}{3}, 0\right]$

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

$2x \le x+1$

$2x-x \le 1$

$x \le 1$



$x \in \langle 0, 1]$

$$\boxed{x \in \left[-\frac{1}{3}, 0\right] \cup \langle 0, 1] = \left[-\frac{1}{3}, 1\right]}$$