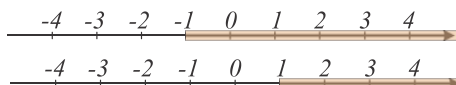


**Algebra.****1. Equalities: equations and identities****Inequalities.**

We can add any number to both part of the inequality, the sign ( $<$  or  $>$ ) will not change:

$$x > -1$$



$$x + 2 > -1 + 2 \Rightarrow x + 2 > 1$$

$$y - 3 < 5$$

$$y - 3 + 3 < 5 + 3$$

$$y < 8, \quad y \in (-\infty, 8)$$

$$1. \quad x + 3 > -5$$



Now let's try to multiply or divide both part of the inequality by the positive number.

If  $x > 3$ , then  $2x$  will be greater than 6.

$$x > 3, \quad 2x > 6$$

If  $x > 3$  what can we tell about  $-x$ ?

$$-x \quad 3 \cdot (-1)$$

$$2. \quad x + 3 > 5x - 5$$

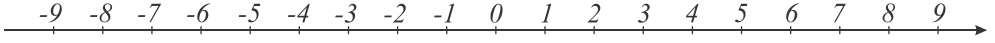
$$3. \quad 4x - 3 \neq 0$$

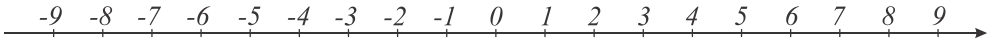
$$4. \quad 3(x - 1) < 5x + 9$$

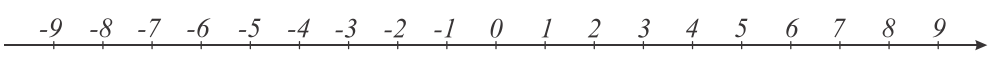
5.  $2x - 1 > -x + 3$

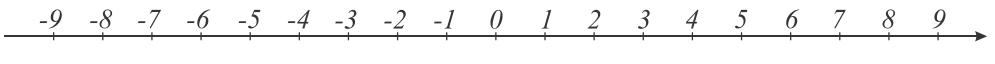
6.  $|x| > 8$

7. Show on the number line points that are satisfying the following inequalities:

a)  $|x| < 4$  

b)  $|x| > 3$  

c)  $\left|x - \frac{1}{2}\right| > 3$  

d)  $\left|x - \frac{1}{2}\right| < 8$  

8.  $M = \{x | x > 5\}$ ,  $K = \{x | x < 20\}$

$M \cap K =$

$M \cup K =$

9.  $M = \{x | x \leq 5\}$ ,  $K = \{x | x \geq 20\}$

$M \cap K =$

$M \cup K =$

10. Points  $a$ ,  $0$ , and  $b$  are marked on the number line below:



Which of the following expressions is true?

1)  $a + b > 0$  or  $a + b < 0$       3)  $ab > 0$  or  $ab < 0$

2)  $a - b > 0$  or  $a - b < 0$       4)  $\frac{b}{a} > 1$  or  $\frac{b}{a} < 1$

11. Points  $a, b, c, 0$ , and  $1$  are marked on the number line below:

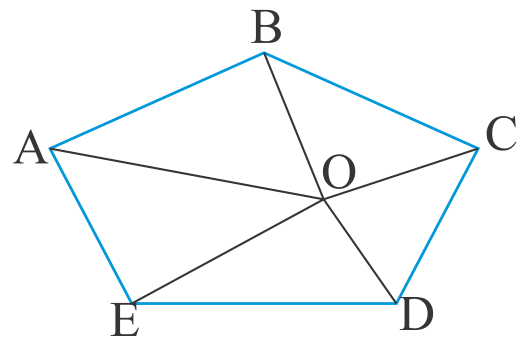


Which of the following expressions is true?

- 1)  $ab < b$  or  $ab > b$
- 2)  $abc < a$  or  $abc > a$
- 3)  $-ac < c$  or  $-ac > c$

12. Sum of the internal angles of any polygon is  $(n - 2) \times 180$ .

$$n \times 180 - 360 = (n - 2) \times 180$$



13. Compute the area of the figures below. The picture is not to scale, so do not try measuring the lengths - use the numbers given. In the last one, the area of the shaded part.

