

LINEAR INEQUALITIES Bell Work

Express the following intervals as sets

1. $[-3, 8]$
2. $(2, 7]$
3. $[-1, 5)$
4. $(6, \infty)$

Express the following sets as intervals

5. $\{x|x \in R, x < 4\}$
6. $\{x|x \in R, -1 \leq x \leq 6\}$
7. $\{x|x \in R, 2 \leq x < 9\}$

Solve the following inequalities and graph its solution

8. $7x + 2 > 16$
9. $4(x + 6) < 2(x - 1)$
10. $x - 4 \leq \frac{1}{2}$
11. $\frac{5x+2}{3} \geq 1$

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ANSWERS

Express the following intervals as sets

Remember that: \leq, \geq are represented with $[a, b]$

$<, >$ are represented with (a, b)

1. $[-3, 8]$

All x such that x is greater than or equal to -3 and less or equal to 8.

$$\{x | x \in R, -3 \leq x \leq 8\}$$

2. $(2, 7]$

All x such that x is greater than 2 and less or equal to 7.

$$\{x | x \in R, 2 < x \leq 7\}$$

3. $[-1, 5)$

All x such that x is greater than or equal to -1 and less than 5.

$$\{x | x \in R, -1 \leq x < 5\}$$

4. $(6, \infty)$

All x such that x is greater than 6

$$\{x | x \in R, x > 6\}$$

Express the following sets as intervals

Remember that:

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$$\{x|x \in R, x < a\} = (-\infty, a)$$

$$\{x|x \in R, x > a\} = (a, \infty)$$

$$\{x|x \in R, x \leq a\} = (-\infty, a]$$

$$\{x|x \in R, x \geq a\} = [a, \infty)$$

$$\{x|x \in R, a \leq x \leq b\} = [a, b]$$

$$\{x|x \in R, a < x \leq b\} = (a, b]$$

$$\{x|x \in R, a \leq x < b\} = [a, b)$$

$$\{x|x \in R, a < x < b\} = (a, b)$$

5.

$$\{x|x \in R, x < 4\} = (-\infty, 4)$$

6.

$$\{x|x \in R, -1 \leq x \leq 6\} = [-1, 6]$$

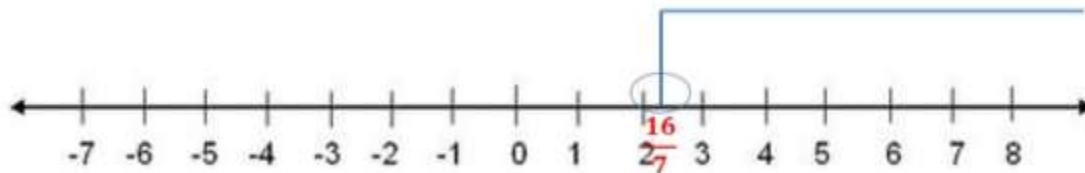
7.

$$\{x|x \in R, 2 \leq x < 9\} = [2, 9)$$

Solve the following inequalities**In each inequality we have to solve for x**

8. $7x + 2 > 16$

$$7x + 2 > 16 \quad \rightarrow \quad 7x > 14 \quad \rightarrow \quad \frac{1}{7}(7x) > \frac{1}{7}(16) \quad \rightarrow \quad x > \frac{16}{7}$$

**Solution:**

$$\{x|x \in R, x > \frac{16}{7}\} = \left(\frac{16}{7}, \infty\right)$$

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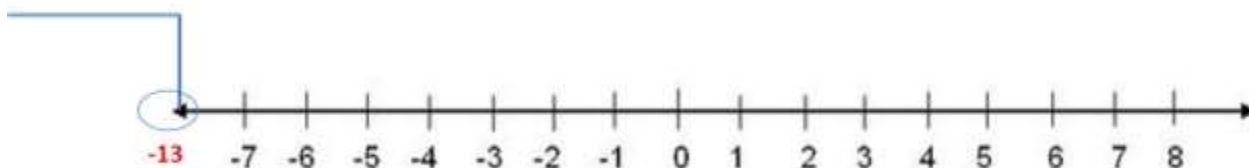
9. $4(x + 6) < 2(x - 1)$

Applying distributive property:

$$4x + 24 < 2x - 2 \quad \rightarrow \quad 2x < -26 \quad \rightarrow \quad \frac{1}{2}(2x) < \frac{1}{2}(-26)$$

Solving for x:

$$x < -13$$

**Solution:**

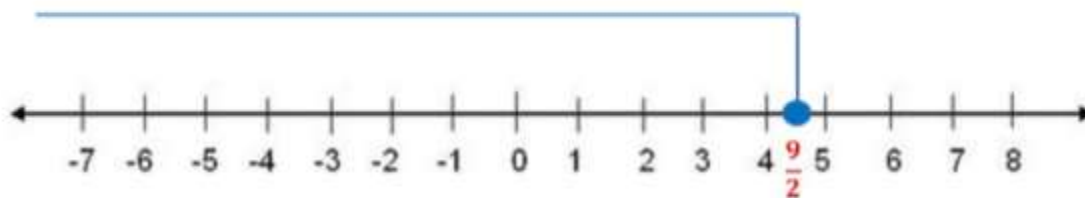
$$\{x|x \in R, x < -13\} = (-\infty, -13)$$

10. $x - 4 \leq \frac{1}{2}$

Solving for x:

$$x - 4 \leq \frac{1}{2} \quad \rightarrow \quad x \leq \frac{1}{2} + 4 \quad \rightarrow \quad x \leq \frac{9}{2}$$

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Solution:

$$\left\{x \mid x \in R, x \leq \frac{9}{2}\right\} = \left(-\infty, \frac{9}{2}\right]$$

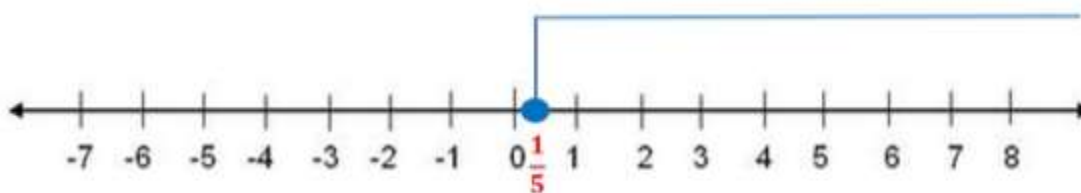
$$11. \frac{5x+2}{3} \geq 1$$

$$3\left(\frac{5x+2}{3}\right) \geq 3(1)$$

Solving for x:

$$5x + 2 \geq 3 \quad \rightarrow \quad \text{simplifying} \quad 5x \geq 3 - 2$$

$$\frac{1}{5}(5x) \geq \frac{1}{5}(1) \quad \rightarrow \quad x \geq \frac{1}{5}$$



Solution:

$$\left\{x \mid x \in R, x \geq \frac{1}{5}\right\} = \left[\frac{1}{5}, \infty\right)$$