

LINEAR INEQUALITIES Assignment

Express the following intervals as sets

1. $[2, 5]$
2. $(-3, 2]$
3. $[1, 8)$
4. $(0, \infty)$
5. $(-\infty, 4]$

Express the following sets as intervals

6. $\{x|x \in R, x < 1\}$
7. $\{x|x \in R, 0 \leq x \leq 4\}$
8. $\{x|x \in R, x \geq 5\}$
9. $\{x|x \in R, 1 \leq x < 6\}$

Solve the following inequalities and graph its solution

10. $2x + 1 \leq 7$
11. $\frac{3x-4}{2} > 5$
12. $2(x - 6) < x - 10$
13. $9x + 8 \leq 3x - 2$
14. $6(2x - 1) \geq 4(x + 5)$

LINEAR INEQUALITIES Assignment

ANSWERS

Express the following intervals as sets

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

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

1. $[2, 5]$

All x such that x is greater than or equal to 2 and less or equal to 5.

$$\{x | x \in R, 2 \leq x \leq 5\}$$

2. $(-3, 2]$

All x such that x is greater than -3 and less or equal to 2.

$$\{x | x \in R, -3 < x \leq 2\}$$

3. $[1, 8)$

All x such that x is greater than or equal to 1 and less than 8.

$$\{x | x \in R, 1 \leq x < 8\}$$

4. $(0, \infty)$

All x such that x is greater than 0

$$\{x | x \in R, x > 0\}$$

5. $(-\infty, 4]$

$$\{x | x \in R, x \leq 4\}$$

Express the following sets as intervals

LINEAR INEQUALITIES Assignment**Remember that:**

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

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

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

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

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

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

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

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

6. $\{x|x \in R, x < 1\} = (-\infty, 1)$

7. $\{x|x \in R, 0 \leq x \leq 4\} = [0, 4]$

8. $\{x|x \in R, x \geq 5\} = [5, \infty)$

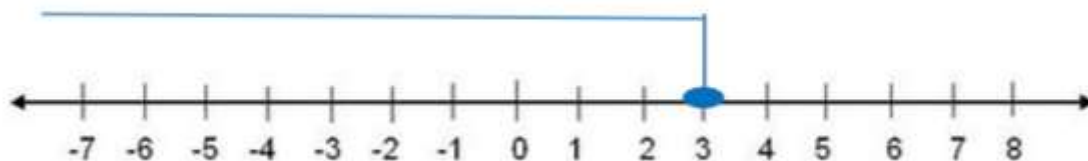
9. $\{x|x \in R, 1 \leq x < 6\} = [1, 6)$

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

10. $2x + 1 \leq 7$

$$2x \leq 7 - 1 \quad \rightarrow \quad 2x \leq 6 \quad \rightarrow \quad \frac{2x}{2} \leq \frac{6}{2} \quad \rightarrow \quad x \leq 3$$

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Solution:

$$\{x | x \in R, x \leq 3\} = (-\infty, 3]$$

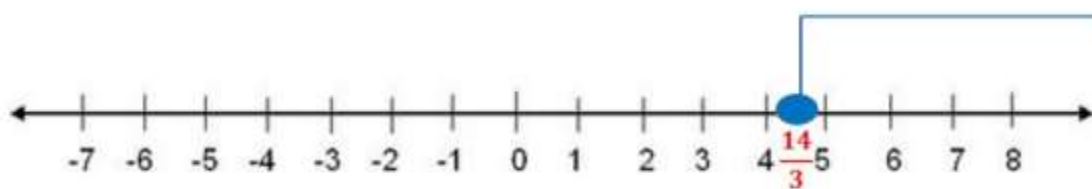
11. $\frac{3x-4}{2} > 5$

Multiplying by 2 both sides:

$$2 \times \left(\frac{3x-4}{2} \right) > 2 \times 5 \quad \rightarrow \quad 3x - 4 > 10 \quad \rightarrow \quad 3x > 14$$

Solving for x:

$$\frac{1}{3}(3x) > \frac{1}{3}(14) \quad \rightarrow \quad x > \frac{14}{3}$$



Solution:

$$\left\{ x \mid x \in R, x > \frac{14}{3} \right\} = \left(\frac{14}{3}, \infty \right)$$

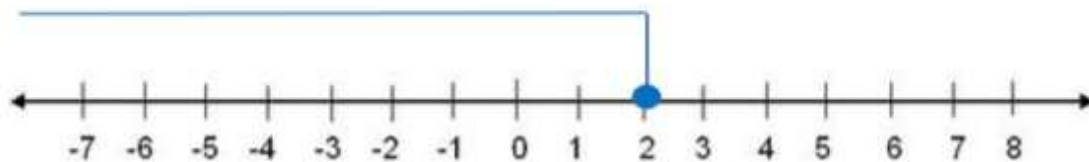
12. $2(x - 6) < x - 10$

Applying distributive property:

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$$2x - 12 < x - 10$$

$$x < 2$$



Solution:

$$\{x | x \in R, x < 2\} = (-\infty, 2)$$

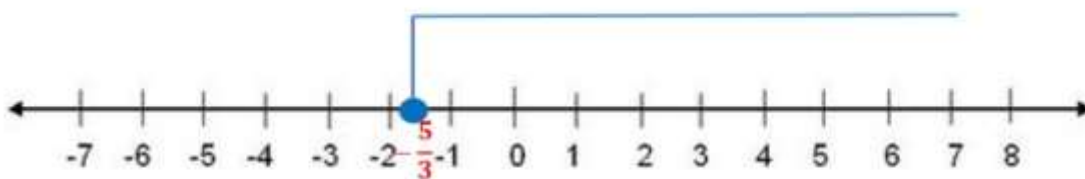
13. $9x + 8 \leq 3x - 2$

$$9x - 3x \leq -2 - 8$$

$$6x \leq -10$$

Multiplying by 6 both sides to solve for x:

$$\frac{1}{6}(6x) \leq \frac{1}{6}(-10) \rightarrow \text{simplifying } x \leq -\frac{5}{3}$$



Solution:

$$\{x | x \in R, x \leq -\frac{5}{3}\} = (-\infty, -\frac{5}{3}]$$

14. $6(2x - 1) \geq 4(x + 5)$

Name: _____ Period: _____ Date: _____

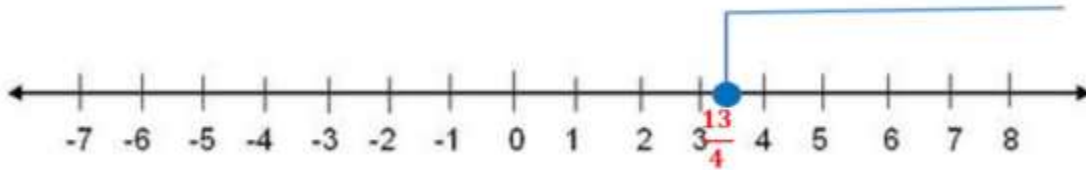
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Applying distributive property:

$$12x - 6 \geq 4x + 20 \quad \rightarrow \quad 12x - 4x \geq 20 + 6 \quad \rightarrow \quad 8x \geq 26$$

Solving for x:

$$\frac{1}{8}(8x) \geq \frac{1}{8}(26) \quad \rightarrow \quad \text{simplifying } x \geq \frac{13}{4}$$



Solution:

$$\left\{x \mid x \in R, x \geq \frac{13}{4}\right\} = \left[\frac{13}{4}, \infty\right)$$