

Name: _____

Date: _____

Unit 2

LESSON 3

Do Now: If $3(x+2) - 2(x+1) = 8$, then what is the value of x ?

$$3x + 6 - 2x - 2 = 8$$

$$x + 4 = 8$$

$$\begin{array}{r} x + 4 = 8 \\ -4 \quad -4 \\ \hline \end{array}$$

$$\boxed{x = 4}$$

Solving Inequalities

For #1- 10 : a) Express the solution set in in set notation and

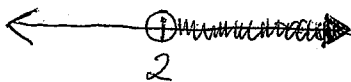
b) Express the solution set graphically on the number line

1. $5x + 10 > 20$

$$\begin{array}{r} 5x + 10 > 20 \\ -10 \quad -10 \\ \hline \end{array}$$

$$\begin{array}{r} 5x > 10 \\ 5 \quad 5 \\ \hline \end{array}$$

$$\boxed{\{x > 2\}}$$

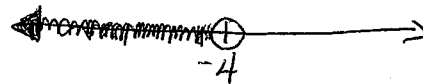


2. $-6y + 2 > 26$

$$\begin{array}{r} -6y + 2 > 26 \\ -2 \quad -2 \\ \hline \end{array}$$

$$\begin{array}{r} -6y > 24 \\ -6 \quad -6 \\ \hline \end{array}$$

$$\boxed{\{y < -4\}}$$



RULE: The cases that we flip the inequality symbol is when we multiply or divide

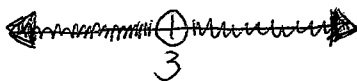
by a negative number.

3. $\frac{x}{3} + 8 \neq 9$

$$\begin{array}{r} \frac{x}{3} + 8 \neq 9 \\ -8 \quad -8 \\ \hline \end{array}$$

$$\frac{x}{3} \neq 1 + 3$$

$$\boxed{\{x \neq 3\}}$$



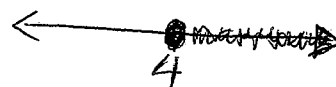
4. $4(x-3) \geq 2(x-2)$

$$\begin{array}{r} 4x - 12 \geq 2x - 4 \\ -2x \quad -2x \\ \hline \end{array}$$

$$\begin{array}{r} 2x - 12 \geq -4 \\ +12 \quad +12 \\ \hline \end{array}$$

$$\begin{array}{r} 2x \geq 8 \\ 2 \quad 2 \\ \hline \end{array}$$

$$\boxed{\{x \geq 4\}}$$



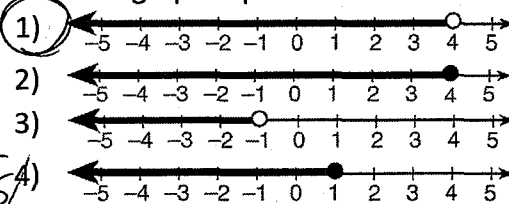
5. What is the solution of the inequality

$$-6x - 17 \geq 8x + 25?$$

- 1) $x \geq 3$
- 2) $x \leq 3$
- 3) $x \geq -3$
- 4) $x \leq -3$

$$\begin{array}{r} -6x - 17 \geq 8x + 25 \\ +6x \quad +6x \\ \hline -17 \geq 14x + 25 \\ -25 \quad -25 \\ \hline -42 \geq 14x \\ \frac{-42}{14} \geq \frac{14x}{14} \\ \boxed{-3 \geq x} \end{array}$$

6. Which graph represents the solution set of $2x - 5 < 3$?



$$\begin{array}{r} +5 +5 \\ \hline 2x < 8 \\ \frac{2x}{2} < \frac{8}{2} \\ \boxed{x < 4} \end{array}$$

7. Which number is in the solution set of the inequality $5x + 3 > 38$?

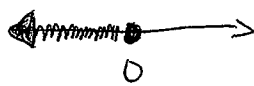
- 1) 8
- 2) 7
- 3) 6
- 4) 5

$$\begin{array}{r} -3 -3 \\ \hline 5x > 35 \\ \frac{5x}{5} > \frac{35}{5} \\ \boxed{x > 7} \end{array}$$

Practice Problems:

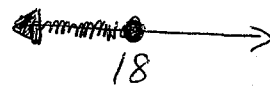
8. $-6(x-5) \geq 30$

$$\begin{array}{r} -6x + 30 \geq 30 \\ -30 \quad -30 \\ \hline -6x \geq 0 \\ \frac{-6x}{-6} \geq \frac{0}{-6} \\ \boxed{\{x \leq 0\}} \end{array}$$



9. $\frac{1}{3}x - 4 \leq 2$

$$\begin{array}{r} +4 +4 \\ \hline \frac{1}{3}x \leq 6 \cdot 3 \\ \boxed{\{x \leq 18\}} \end{array}$$



10. Which number is in the solution set of the inequality $6x + 2 < 8x + 14$?

- 1) -7
- 2) -6
- 3) -5
- 4) -10

$$\begin{array}{r} 6x + 2 < 8x + 14 \\ -8x \quad -8x \\ \hline -2x < 12 \\ \frac{-2x}{-2} < \frac{12}{-2} \\ \boxed{\{x > -6\}} \end{array}$$

11. $-1.6(x+2) \leq 9.8$

$$\begin{array}{r} -1.6x - 3.2 \leq 9.8 \\ +3.2 \quad +3.2 \\ \hline -1.6x \leq 13 \\ \frac{-1.6x}{-1.6} \leq \frac{13}{-1.6} \\ \boxed{x \geq -8.125} \end{array}$$

Summary: What is the difference in solving the two inequalities below?

(a) $1 + 4x < 13$

$$\begin{array}{r} 4x < 12 \\ x < 3 \end{array}$$

(b) $1 - 4x < 13$

$$\begin{array}{r} -4x < 12 \\ x > -3 \end{array}$$

Divide by a $(-)$, flip symbol!