

Name W / DB Period: _____

UNIT 1 PART 2 STUDY GUIDE
Coordinate Algebra

Solving Inequalities is the same as solving an equation. You use the same steps as equations, but the only difference is if you multiply or divide by a negative number you must **FLIP** the inequality sign so the opening goes the other way.

Remember: When you graph the answer to the inequality, if the sign is $<$ or $>$ the circle is not shaded and if the sign is \leq or \geq the circle is shaded.

Represent each of the following as an algebraic inequality.

1) x is at most 30

$$\underline{x \leq 30}$$

2) the sum of $5x$ and $2x$ is at least 14

$$\underline{5x + 2x \geq 14}$$

3) the product of x and y is less than or equal to 4

$$\underline{x \cdot y \leq 4}$$

4) 5 less than a number y is under 20

$$\underline{y - 5 < 20}$$

1st: Read carefully and underline key words

2nd: Write a let statement

3rd: Determine whether to use $<$, \leq , $>$, or \geq

4th: Write and solve the inequality

- 6) The sum of twice a number and 5 is at most 15. What are the possible values for the number?

$$2x + 5 \leq 15$$

$$2x \leq 10$$

$$x \leq 5$$

$x =$ possible values

all values less than or = to 5

- 7) The cost of a gallon of orange juice is \$3.50. What is the maximum number of containers you can buy for \$15?

$$\frac{3.50x \leq 15}{3.50} \quad \frac{15}{3.50}$$

$$x < \underline{4.28}$$

$x =$ # containers

4 gallons of OJ

- 8) Three times a number increased by 8 is no more than the number decreased by 4. Find the number.

$$3x + 8 \leq x - 4$$

$$2x \leq -12$$

$$x \leq -6$$

$x =$ the # im looking for

the # is -6

- 9) Two-thirds of a number plus 5 is greater than 12. Find the number.

$$\frac{2}{3}x + 5 > 12$$

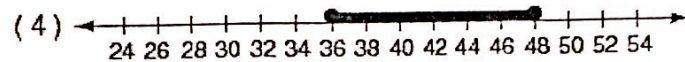
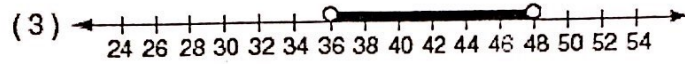
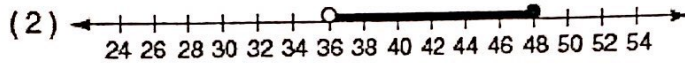
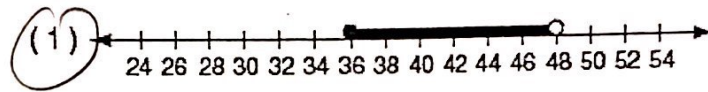
$$3 \cdot \frac{2}{3}x > 7 \cdot 3$$

$$\frac{2x}{2} > \frac{21}{2}$$

$x =$ the # im looking for

the # is $\frac{21}{2}$

- 1 10) In order to be admitted for a certain ride at an amusement park, a child must be greater than or equal to 36 inches tall and less than 48 inches tall. Which graph represents these conditions?



- 2 11) Which statement is modeled by $2p + 5 < 11$?

- (1) The sum of 5 and 2 times p is at least 11.
 (2) Five added to the product of 2 and p is less than 11.
 (3) Two times p plus 5 is at most 11.
 (4) The product of 2 and p added to 5 is 11.

- 5 12) Which is NOT a solution of the inequality $5 - 2x \geq -3$?

- (1) 0 ✓ (2) 2 ✓ (3) 4 ✓

(4) 5

$$\begin{array}{r} 5 - 2x \geq -3 \\ -5 \qquad -5 \\ \hline -2x \geq -8 \\ \frac{-2x}{-2} \geq \frac{-8}{-2} \end{array}$$

Solutions: $x \leq 4$

- 1 13) Which statement can be modeled by $x + 3 \leq 12$?

- (1) Sam has 3 bottles of water. Together, Sam and Dave have at most 12 bottles of water.
 (2) Jennie sold 3 cookbooks. To earn a prize, Jennie must sell at least 12 cookbooks.
 (3) Peter has 2 baseball hats. Peter and his brothers have fewer than 12 baseball hats.
 (4) Kathy swam 3 laps in the pool this week. She must swim more than 12 laps.

14) The sum of a number and 81 is greater than the product of -3 and that number. What are the possible values for the number?

x = possible values

$$\begin{array}{l} x + 81 > -3x \\ +3x \quad +3x \\ \hline 4x + 81 > 0 \\ -81 \quad -81 \\ \hline 4x > -81 \\ \frac{4x}{4} > \frac{-81}{4} \\ x > -20.25 \end{array}$$

values greater than -20.25

15) Four times a number is greater than -48. What are the possible values for the number?

x = possible values

$$\begin{array}{l} 4x > -48 \\ \frac{4x}{4} > \frac{-48}{4} \\ x > -12 \end{array}$$

values are greater than -12

Solve the inequality and graph the solution and give interval notation. Highlight your answer.

16. $3x - 4 < 2$

$$\begin{array}{l} 3x - 4 < 2 \\ +4 \quad +4 \\ \hline 3x < 6 \\ \frac{3x}{3} < \frac{6}{3} \\ x < 2 \end{array}$$



17. $2(5x - 3) \geq 14$

$$\begin{array}{l} 10x - 6 \geq 14 \\ +6 \quad +6 \\ \hline 10x \geq 20 \\ \frac{10x}{10} \geq \frac{20}{10} \\ x \geq 2 \end{array}$$



18. $\frac{8}{3} - 3x < 17$

$$\begin{array}{l} \frac{8}{3} - 3x < 17 \\ -\frac{8}{3} \quad -\frac{8}{3} \\ \hline -3x < \frac{49}{3} \\ \frac{-3x}{-3} < \frac{49}{-3} \\ x > -\frac{49}{3} \end{array}$$



19. $12x - 6 \geq 14x - 2$

$$\begin{array}{l} 12x - 6 \geq 14x - 2 \\ -12x \quad -12x \\ \hline -6 \geq 2x - 2 \\ +2 \quad +2 \\ \hline -4 \geq 2x \\ \frac{-4}{2} \geq \frac{2x}{2} \\ -2 \geq x \end{array}$$

