

5-31-18

Aim: SWBAT review.

HW: Review Quiz #1 Monday (Review Pages 1 - 19)

Final Exam Tuesday June 12th

Textbook due on or before the final exam

Do Now: Review Packet and Calculator

INEQUALITIES

Use an Open Circle ○

Use a Closed Circle ●

&gt; "is greater than"

≥ "is greater than or equal to"

&lt; "is less than"

≤ "is less than or equal to"

≠ "is not equal to"

## True or False

 $4 > 4$  False 4 is not greater than 4 $4 \geq 4$  True 4 is not greater than 4, however, 4 is equal to 4.

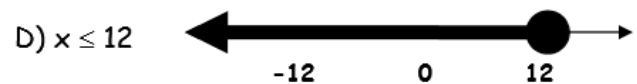
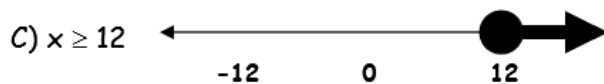
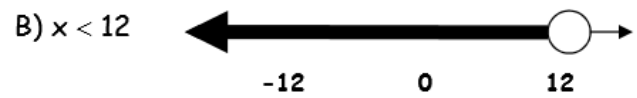
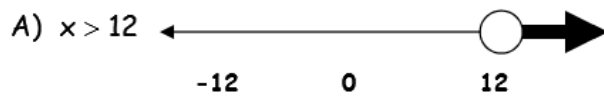
## GRAPHING INEQUALITIES

You can only graph an inequality on a number line if the VARIABLE is BY ITSELF.

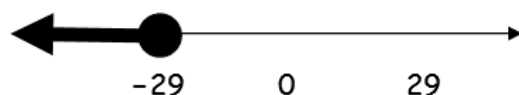
You solve inequalities the same way you solve equations. Remember, whatever you do to one side of the inequality you must do the same thing to the other side.

Graph each solution to the following inequalities on a number line.

(Hint: If the variable is on the left side of the inequality symbol shade the direction the symbol points to.)



$$\begin{array}{r} E) \ x + 9 \leq -20 \\ \underline{-9 \quad -9} \\ x \leq -29 \end{array} \rightarrow \text{(You cannot graph this inequality until you get } x \text{ by itself!)} \\ \rightarrow \text{(Now you can graph this inequality because } x \text{ is by itself.)}$$



$$\begin{array}{r} F) \ -2x + 7 < 25 \\ \underline{-7 \quad -7} \\ -2x < 18 \\ \underline{-2 \quad -2} \rightarrow \text{FLIP SIGN} \\ x > -9 \end{array}$$



Write yes or no if the inequality symbol needs to **FLIP?** (Look for a negative coefficient or a negative denominator)

47)  $8(y + 5) \geq 80$

No

48)  $-4y + 11 \leq 9$

Yes

49)  $y + 12 < 54$

No

50)  $\frac{y}{-9} > -3$

Yes

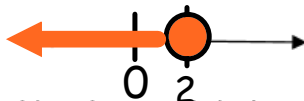
Graph each inequality on a number line.

51)  $x > 5$

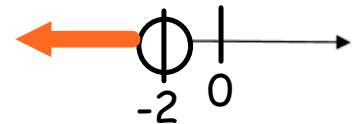
$5 < x$   
 $x > 5$



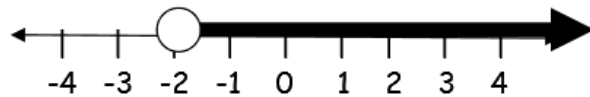
52)  $x \leq 2$



53)  $x < -2$



54) Write the inequality represented by the graph below.



$x > -2$

Solve and graph on a number line.

55)  $x + 12 \leq 9$

$$\begin{array}{r} x + 12 \leq 9 \\ -12 \quad -12 \\ \hline \end{array}$$

$x \leq -3$

56)  $-15 + x > 19$

$$\begin{array}{r} -15 + x > 19 \\ +15 \quad +15 \\ \hline \end{array}$$

$x > 34$

57)  $-0.9x > 0.54$

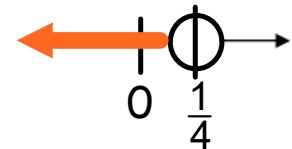
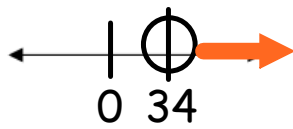
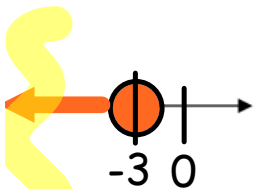
$$\begin{array}{r} -0.9x > 0.54 \\ -0.9 \quad -0.9 \\ \hline \end{array}$$

$x < -0.6$

58)  $x + \frac{1}{2} < \frac{3}{4}$

$$\begin{array}{r} x + \frac{1}{2} < \frac{3}{4} \\ -\frac{1}{2} \quad -\frac{1}{2} \\ \hline \end{array}$$

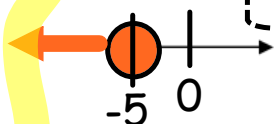
$x < \frac{1}{4}$



59)  $-2x + 7 \geq 17$

$$\begin{array}{r} -2x + 7 \geq 17 \\ -7 \quad -7 \\ \hline -2x \geq 10 \\ -2 \quad -2 \\ \hline \end{array}$$

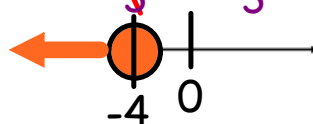
$x \leq -5$



60)  $8x - 7 \leq 5x - 19$

$$\begin{array}{r} 8x - 7 \leq 5x - 19 \\ -5x \quad -5x \\ \hline 3x - 7 \leq -19 \\ +7 \quad +7 \\ \hline 3x \leq -12 \\ \frac{3x}{3} \leq \frac{-12}{3} \end{array}$$

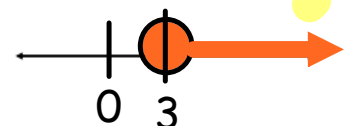
$x \leq -4$



61)  $4x - 10 + 6x \geq 20$

$$\begin{array}{r} 4x - 10 + 6x \geq 20 \\ 10x - 10 \geq 20 \\ +10 \quad +10 \\ \hline 10x \geq 30 \\ \frac{10x}{10} \geq \frac{30}{10} \end{array}$$

$x \geq 3$



**Translating phrases into mathematical EQUATIONS or INEQUALITIES:**

- Inequalities will contain one or more operations and one of the four inequality symbols ( $<$ ,  $>$ ,  $\leq$  or  $\geq$ ). Equations will have an equal sign.
- Use the chart below to help you determine the sign you will need.

**Writing Inequalities** The following common sentences indicate the four types of inequalities.

$a < b$ $a$ is less than $b$ . $a$ is fewer than $b$ .	$a > b$ $a$ is greater than $b$ . $a$ is more than $b$ .
$a \leq b$ $a$ is less than or equal to $b$ . $a$ is at most $b$ . $a$ is no more than $b$ .	$a \geq b$ $a$ is greater than or equal to $b$ . $a$ is at least $b$ . $a$ is no less than $b$ .

Translate the following into an algebraic equation or inequality.

62) The (sum) of twice a number,  $n$ , and 9 is less than 37.

$$(2n + 9) < 37$$

63) Six times the (difference) of a number,  $x$  and 3 is 24.

$$6(x - 3) = 24$$

64) Four times a number,  $x$  plus nine is at most 30.

$$4x + 9 \leq 30$$

65) Three times a number,  $x$  minus 4 is no more than 5.

$$3x - 4 \leq 5$$

66) Three times a number,  $x$ , increased by 5 is at least -13.

$$3x + 5 \geq -13$$

67) A number,  $x$ , divided by -5 is greater than 8.

$$\frac{x}{-5} > 8$$

68) Four more than a number,  $n$ , is no more than thirteen.

$$n + 4 \leq 13$$

69) The (difference) of a number,  $n$ , and -6 is 9.

$$(n - -6) = 9$$

70) A number,  $n$ , decreased by 11 is no less than 17.

$$n - 11 \geq 17$$

71) Nine more than 4 times a number is at least 30.

$$4n + 9 \geq 30$$

72) Three times a number divided by 4 is no more than 5.

$$3 \cdot \frac{x}{4} \leq 5$$

## Unit 3: Ratios &amp; Proportionality

We use proportions to solve for missing information, to solve word problems, conversion problems, scale problems and so much more. The key to using proportions correctly is to

**BE CONSISTENT!!!!**

Once you set up a proportion just cross multiply and solve algebraically.

$$1) \frac{6}{16} = \frac{x}{24} \quad \frac{16x}{16} = \frac{144}{16} \quad \boxed{x = 9}$$

$$2) \frac{7}{8} = \frac{x}{40} \quad \frac{8x}{8} = \frac{280}{8} \quad \boxed{x = 35}$$

$$3) \frac{3}{5} = \frac{6}{x+4} \quad 3(x+4) = 30 \quad 3x + 12 = 30 \quad -12 \quad \underline{\quad} \quad 3x = 18 \quad \underline{\quad} \quad x = 6$$

Is each of the following a proportion? Answer YES or NO.

$$4) \frac{3.5}{0.7} = \frac{1.5}{0.3} \quad \text{Yes} \quad 3.5 \cdot 0.3 = 0.7 \cdot 1.5$$

$$5) \frac{3}{4} = \frac{2}{5} \quad \text{No} \quad \frac{2}{3} \cdot \frac{3}{7} \neq \frac{3}{4} \cdot \frac{2}{5}$$

- 6) A microscope slide shows 37 red blood cells out of 60 blood cells. How many red blood cells would be expected in a sample of the same blood that has 900 blood cells?

$$\frac{37}{60} = \frac{n}{900} \quad \frac{60n}{60} = \frac{33,300}{60} \quad n = 555$$

555 red blood cells would be expected.

- 7) The distance from the roller coaster to the food court on the map is 3.5 centimeters. If the scale on the map is 1 cm = 10 m then find the actual distance to the food court.

$$\frac{1}{10} = \frac{3.5}{n} \quad \frac{n}{1} = \frac{35}{1} \quad n = 35$$

The actual distance to the food court is 35 m.

- 8) On a scale drawing of a house, the dimensions of the living room are 4 inches by 3 inches. If the scale of the drawing is 1 in = 6 ft, find the actual length and width of the living room. (You will need two separate proportions)

Length:  $\frac{1}{6} = \frac{4}{n} \quad \frac{n}{1} = \frac{24}{1} \quad n = 24$

Width:  $\frac{1}{6} = \frac{3}{n} \quad \frac{n}{1} = \frac{18}{1} \quad n = 18$

Length = 24ft  
Width = 18ft

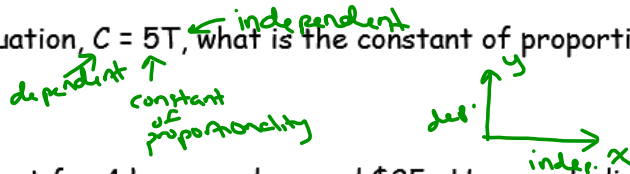
- 9) If  $10\frac{1}{2}$  quarts of strawberries to make 3 strawberry shortcakes. How many quarts of strawberries will you need to make one strawberry shortcake?

$$\frac{10\frac{1}{2} \text{ quarts}}{3 \text{ shortcakes}} = 3\frac{1}{2} \text{ quarts/shortcake}$$

- 10) If it rained 6 inches in 3 weeks how many inches did it rain per week? \_\_\_\_\_

$$\frac{6 \text{ inches}}{3 \text{ weeks}} = 2 \text{ inches/week}$$

11) Given the equation,  $C = 5T$ , what is the constant of proportionality? 5



12) Kelsey babysat for 4 hours and earned \$25. How much did Kelsey earn per hour?

$$\frac{\$25}{4 \text{ hours}} = \$6.25/\text{hour}$$

13) Lee packed 2 sweatshirts and 6 T-shirts in her suitcase. Which ratio does not represent the number of sweatshirts to the number of T-shirts in Lee's suitcase?

- A) 1 to 3      B) 1 : 3      C) 3 to 1      D)  $\frac{1}{3}$

14) One mechanic can repair 4 cars a day. Which proportion shows how to find the number of mechanics needed to repair 20 cars in a day if they all work at the same rate?

- A)  $\frac{1}{4} = \frac{20}{n}$       B)  $\frac{1}{4} = \frac{n}{20}$       C)  $\frac{1}{20} = \frac{n}{4}$       D)  $\frac{n}{1} = \frac{4}{20}$

15) Tell which is the better buy. Show all work and explain your answer.

20 pounds of pet food for \$14.99 OR 50 pounds of pet food for \$37.99

$$\frac{\$14.99}{20 \text{ pounds}} = 0.7495 \longrightarrow \$0.75/\text{pound}$$

$$\frac{\$37.99}{50 \text{ pounds}} = 0.7598 \longrightarrow \$0.76/\text{pound}$$

The 20 pound bag is a better buy because it costs less per pound.

16) Tell which is the better buy. Show all work and explain your answer.

2 compact discs for \$26.50 OR 3 compact discs for \$40.00

$$\frac{\$26.50}{2 \text{ CD's}} = 13.25 \longrightarrow \$13.25/\text{CD}$$

$$\frac{\$40.00}{3 \text{ CD's}} = 13.3333... \longrightarrow \$13.33/\text{CD}$$

The 2 pack of CD's is a better buy because it costs less CD.

17) A grocery store sells different types of Trail Mix. The cost and weight of each type is shown in the table.

	Trail Mix A	Trail Mix B	Trail Mix C
Cost (\$)	6	8.50	2.25
Weight	$\frac{3}{4}$ lb	1 lb	4 oz

\*\*16 oz = 1 lb

1 lb = 16 oz      \$8/lb      \$8.50/lb      \$9/lb

Which statement is correct?

- A) Trail Mix A is the best buy.  
 B) Trail Mix B is the best buy.  
 C) Trail Mix C is the best buy.  
 D) They are all the same price.