Guided Notes Chapter 3

Chapter 3 Section 1

Objective: To graph and write algebraic inequalities

Inequality: a "math" sentence that contains ______________________

Solution of an Inequality: any value that makes the inequality ______

Read > as __________________

Read < as __________________

Read ≥ as __________________

Read ≤ as __________________

Read ≠ as __________________

Graph the Inequality:

Open Circle: ________________  Closed Circle: ________________

Identifying Solutions of an Inequality

1) Which numbers are solution of the inequality x ≤ 2; -3, 0, 4.5

2) Which numbers are solutions of the inequality m > -3; -8, -2, 1.4

Graphing Inequalities

3) Graph the solution of each inequality.

a) x > -2
b) $y \leq 7$


c) $2 \leq g$


d) $-6 > b$


**Writing Inequalities**

4) Write an inequality for each graph.

![Graph a)](image)

4) **a)** Write an inequality for each graph.

![Graph b)](image)

4) **b)** Write an inequality for each graph.

![Graph c)](image)

4) **c)** Write an inequality for each graph.
Challenge

1) Graph the inequality \(-2 < x < 5\)

2) Write an inequality for this graph.

Application:

1) Write an inequality to model each situation.
   
a) To be labeled sugar free, a food product must contain less than 0.5 g of sugar per serving.
   
b) A doctor has earned more than $50,000 since being hired.
   
c) The restaurant can seat at most 150 people.
   
d) A person must be at least 16 years old to drive.
Bell Ringer- Write an inequality for each verbal statement. Then graph the solution.

1) A dog weighs less than 25 pounds.

2) You must be at least 15 years old to play on the softball team.

Chapter 3 Section 2

Objective: To solve inequalities by adding or subtracting

Addition Property of Inequality: If you add the same value to each side of the inequality, the two sides remain equal.

If \(a > b\) then ________________________

If \(a < b\) then ________________________

Subtraction Property of Inequality: If you subtract the same value to each side of the inequality, the two sides remain equal.

If \(a > b\) then ________________________

If \(a < b\) then ________________________
Solving Inequalities by Addition:

1) \( x - 4 \leq 6 \)

2) \( y - 10 > 14 \)

Solving Inequalities by Subtraction:

3) \( y + 7 \geq 12 \)

4) \( w + 4 \leq -5 \)
On Your Own.

1) Solve and graph the following inequalities.
   a) $x - 7 > -12$

   $x - 7 > -12$

   b) $y + 8 \leq -15$

   $y + 8 \leq -15$

Application:

1) Write and solve an inequality for each situation.
   a) A school bus can safely carry as many as 76 students. If 19 students are already on the bus, how many more can board the bus?

   b) To get an A, you need more than 200 points on a two-part test. You score 109 on the first part. How many more points do you need?
c) The driver of a car puts money in a meter to pay for 45 minutes of parking. The driver can walk from the car to the store and back again in 8 minutes. Write and solve an inequality to find how many minutes the driver can be inside the store.

d) Your parents give you $35 for a scooter that costs at least $100. Write and solve an inequality to find out how much money you have to save to buy the scooter.

Chapter 3 Section 3

Objective: To solve inequalities by multiplying or dividing.

Multiplication Property of Equality:
- If you multiply each side of an equation by the same __________ number, the direction of the inequality symbol remains __________.
  
  If \( a > b \) then ________________

- If you multiply each side of an equation by the same __________ number, the direction of the inequality symbol is __________.
  
  If \( a > b \) then ________________

Division Property of Equality:
- If you divide each side of an equation by the same __________ number, the direction of the inequality symbol remains __________.
  
  If \( a > b \) and \( c \) is positive then ________________

- If you divide each side of an equation by the same __________ number, the direction of the inequality symbol is ________________.
Solving Inequalities by Division

1) $-3 \leq -27$

2) $-4p < 36$

3) $1.8m \geq -5.4$

4) $7n > 49$

If $a > b$ and $c$ is negative then ___________

Solving Inequalities by Multiplication

5) $\frac{y}{-8} > 2$
6) \( \frac{k}{-5} < -4 \)

7) \( \frac{m}{7} > -14 \)

8) \( \frac{x}{-15} < 3 \)

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Solving Inequalities by Multiplying by the Reciprocal

9) \( \frac{-2}{3}h < -6 \)

10) \( \frac{-3}{4}w \geq 12 \)
Application:

1) Write and solve an inequality for each situation.

   a) Your class is taking a trip to a museum that is 190 miles away. The bus can travel at 55 miles per hour. At least how many hours should your class plan for the trip at the museum?

   b) A long distance telephone company is offering a special rate of $0.06 per minute. Your budget for long distance telephone calls is $25 for the month. At most how many minutes of long distance can you use for the month with this rate?

Bell Ringer: Solve and graph each inequality.

1) \( x - 17 > -54 \)

2) \( 26 + y \leq -18 \)

3) \( -14z < -28 \)

4) \( \frac{w}{a} \geq -4 \)
Objective: To solve two-step inequalities using inverse operations

Solving Two-Step Inequalities

1) \( 9 + \frac{2}{3}x < 1 \)

2) \( \frac{n}{3} - 4 \geq -8 \)

3) \(-3x - 4.5 > 4.5 \)

4) \( \frac{b}{-4} - \frac{3}{8} \leq \frac{1}{8} \)
5) $5 - 1.6x > 7.4$

6) $\frac{1}{2} > \frac{2}{3}m + \frac{1}{3}$

Challenge

1) $-3(x - 4) < 24$

2) $5p + 8 - 7p - 4 > 10$
3) \(15 \leq 2x - 5 \leq 25\) (HONORS ONLY)

Application: Write and solve an inequality for each situation.

a) A music club charges $0.75 per song download plus a membership fee of $5.70. Dan can spend at most $15. What is the greatest number of songs that Dan can download?

b) A phone plan charges $0.20 per text message plus a monthly fee of $42.50. Lin can spend at most $50. Write an inequality for the number of text messages Lin can send.