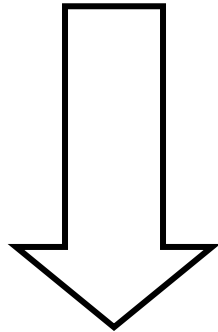


Solving Inequalities



HOMEWORK/PRACTICE WORKSHEETS

- **Inequalities and their Number Line Graphs**
- **Solving One-step Inequalities with Addition Property**
- **Solving One-step Inequalities with Multiplication Property**
- **Solving Two-step Inequalities**
- **Solving Multi-step Inequalities**
- **Inequality Word Problems**
- **Solving Compound Inequalities with “and” (includes interval notation)**
- **Solving Compound Inequalities with “or”**
- **Solving Absolute Value Inequalities**

Unit 3

Inequalities and Their Graphs

Name _____

Date _____ Per _____

Identify all solutions to each inequality:

1. $x < 11$

- a. -3 b. 0 c. 11 d. 16

2. $x > 5$

- a. -7 b. 0 c. 5 d. 9

3. $x \leq -6$

- a. -10 b. -3 c. -6 d. 0

4. $x \geq 2$

- a. -7 b. 0 c. 2 d. 8

5. $2x > 7$

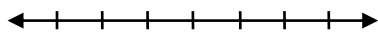
- a. -9 b. 0 c. 4 d. 9

6. $x + 3 < -2$

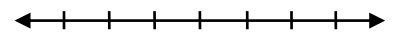
- a. -7 b. -5 c. -4 d. 4

Graph each inequality below: (watch out for open or closed point)

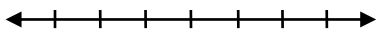
7. $x > 5$



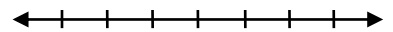
8. $x \leq 10$



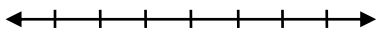
9. $x < -3$



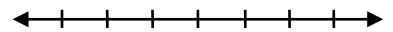
10. $x > -1$



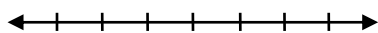
11. $x \leq -4$



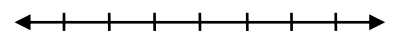
12. $x \geq -2$



13. $x \geq 6$



14. $x < 6$



For each word description below,
first, define the variable, and then write the inequality.

1. The winner of the tournament will win at least \$5,000 in cash and prizes.

Let ___ = _____ Inequality: _____

2. To train for the marathon, Julia ran over 30 miles each week.

Let ___ = _____ Inequality: _____

3. To lose weight, most people need to eat at most 1,600 calories a day.

Let ___ = _____ Inequality: _____

4. The average car on the road today has less than 42,000 miles on it.

Let ___ = _____ Inequality: _____

5. Top tweeters, average over 130 tweets a day.

Let ___ = _____ Inequality: _____

Review:

1. $7x + 5 - 3x - 7 = 10$

2. $-6x + 3 = 2x - 21$

3. $6|x| - 2 = 22$

One-step Inequality Practice

Name _____

With Addition Property of Inequality

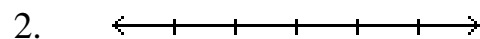
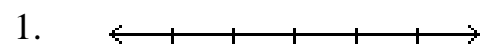
Date _____ Per _____

Problems Set:

Number Lines:

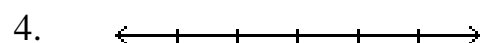
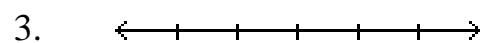
1. $k + 20 < 1$

2. $k - 3 \geq -1$



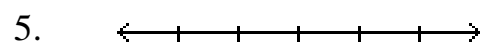
3. $a + 16 \leq 10$

4. $24 \leq p + 7$



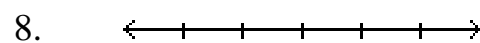
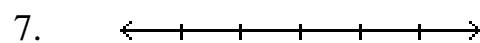
5. $-9 + x > -2$

6. $-3 \geq x + 5$



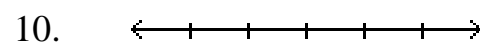
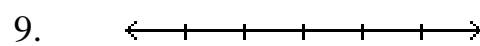
7. $-13 \geq n - 4$

8. $-5 + x < 2$



9. $6x + 2 - 5x \leq -7$

10. $-3x - 5 + 4x > 8$



Review Problems:

For each of the following first, define your variable, then write an inequality.

1. You must be at least 54" to ride the Screaming Suicide roller coaster.
2. Anna's mom can work at most 40 hours a week.
3. You must have less than 6 tardies in any class.
4. Joey was late to school at least 12 times last semester.
5. Jeff's dad makes more than \$60,000 dollars a year.
6. There can be at most 38 students enrolled in a class.

Circle all of the solutions to: $3x + 2 \geq -4$

- a. -6 b. -1 c. 0 d. 1 e. 2 f. 4

One-step Inequality Practice with Multiplication Property of Inequality

Name _____

Date _____ Per _____

Problems Set:

1. $\frac{x}{2} \leq 4$

2. $-\frac{x}{2} \geq 3$

3. $\frac{x}{3} > -5$

4. $-\frac{x}{2} < -10$

5. $\frac{3}{5}x \leq 6$

6. $-\frac{2}{3}x < 6$

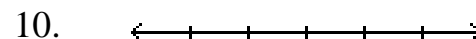
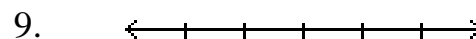
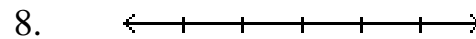
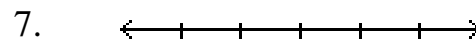
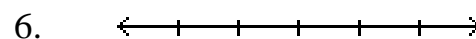
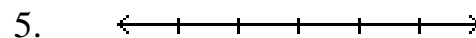
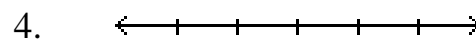
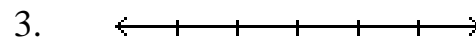
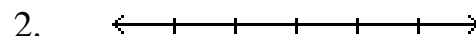
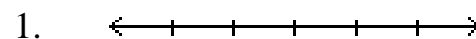
7. $6x > 5$

8. $-7x \geq 4$

9. $-2x \leq -3$

10. $-8x \leq 32$

Number Lines:



Two-Step Inequality Practice

Name _____

Date _____ Per _____

Problems Set:

1. $4x - 7 > 17$

2. $-2x + 36 < 4$

3. $-6x - 1 \leq 23$

4. $\frac{x}{5} - 9 > 3$

5. $-\frac{x}{2} + 20 \leq 4$

6. $-9x + 5 \geq -58$

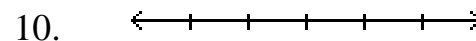
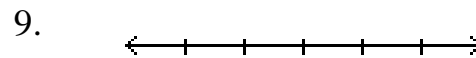
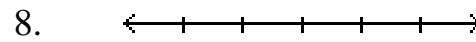
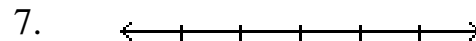
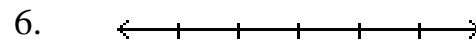
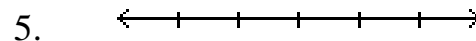
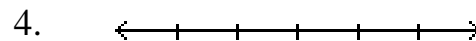
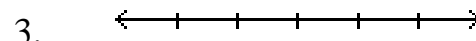
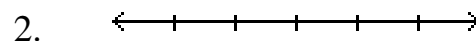
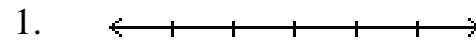
7. $10 - 8x > 26$

8. $42 > 3x + 3$

9. $14 < 5x + 34$

10. $26 \leq -7x - 2$

Number Lines:

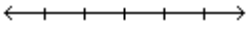
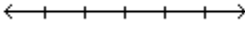
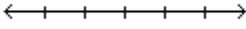
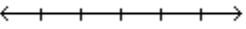
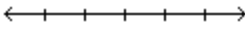
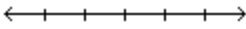
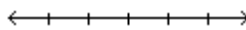
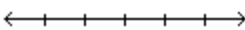
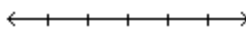


Solving Multi-step Inequalities #1

Name _____

Date _____ Per _____

Solve and Graph:

<p>1. $3(x + 5) \geq -45$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. -18 c. -20 b. -10 d. -22</p>	<p>2. $-10(w + 8) > 30$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. -15 c. -11 b. -20 d. 8</p>	<p>3. $-5(2x + 6) < 10$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. -7 c. -3 b. -5 d. 0</p>
<p>4. $-10 > 5(m + 3)$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. -11 c. -3 b. -5 d. 0</p>	<p>5. $2(7w - 8) \geq -86$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. -11 c. -3 b. -5 d. 0</p>	<p>6. $-130 < -5(2n + 5)$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. 8 c. 10.3 b. 10 d. 15</p>
<p>7. $4(-3x - 5) + 24 \leq 40$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. -6 c. 2 b. -3 d. 12</p>	<p>8. $5 + 2(3x - 1) < -21$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. -11 c. -5 b. -8 d. -4</p>	<p>9. $12 - 8(x - 3) \geq 44$</p> <p style="text-align: center;"></p> <p>Which of these are solutions?</p> <p>a. 8 c. 0 b. 3 d. -5</p>

Solving Multi-step Inequalities #2

Name _____

Date _____ Per _____

Solve and Graph:

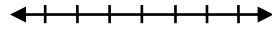
<p>1. $5w + 9 \geq 3w + 7$</p> <p style="text-align: center;">\longleftrightarrow</p>	<p>2. $6p - 1 < 3p + 8$</p> <p style="text-align: center;">\longleftrightarrow</p>
<p>3. $3w + 16 > 6 + 4w$</p> <p style="text-align: center;">\longleftrightarrow</p>	<p>4. $2k - 3 \leq 5k + 12$</p> <p style="text-align: center;">\longleftrightarrow</p>
<p>5. $2(p - 8) > -8 + 3p$</p> <p style="text-align: center;">\longleftrightarrow</p>	<p>6. $3m + 6 < -5(m + 2)$</p> <p style="text-align: center;">\longleftrightarrow</p>
<p>7. $4(3y - 1) < 2(y + 3)$</p> <p style="text-align: center;">\longleftrightarrow</p>	<p>8. $2(3x + 7) \leq 4(-2x + 7)$</p> <p style="text-align: center;">\longleftrightarrow</p>
<p>9. $22 - (4x - 2) > 2(x + 3)$</p> <p style="text-align: center;">\longleftrightarrow</p>	<p>10. $5c + 4(c - 1) \geq 2 + 5(c + 2)$</p> <p style="text-align: center;">\longleftrightarrow</p>

Inequality Word Problems

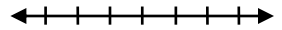
Name _____

Date _____ Period _____

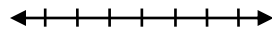
1. Four more than three times a number is greater than nineteen. Solve and graph..



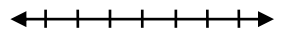
2. Five less than six times a number is less than or equal to twenty-five. Solve and graph..



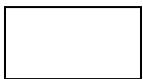
3. Three more than five times a number is greater than or equal to three more than eight times the number. Solve and graph.



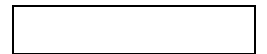
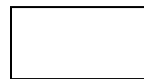
4. One more than three times a number is less than the number decreased by five. Solve and graph.



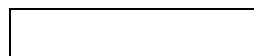
5. A rectangle has a length at least four more than five times the width. If the perimeter is greater than or equal to 32 units, find the least possible width and length.



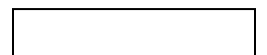
6. A rectangle has a length at most two more than seven times the width. If the perimeter is less than or equal to 52 units, find the least possible width and length.



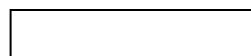
7. Find the smallest three consecutive integers with a sum is at least 93.



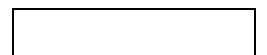
8. Find largest three consecutive even integers with a sum is at most 126.



9. Find the smallest three consecutive integers with a sum is greater than 20.



10. Find the largest three consecutive odd integers with a sum is less than 50.



Solving Compound Inequalities

Name _____

With “and”

Date _____ Per _____

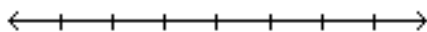
Write the compound inequality for each situation in both **regular notation** and **interval notation**, then **graph** it.

1. All real numbers between -4 and 1

Regular notation: _____

Interval notation: _____

Graph:

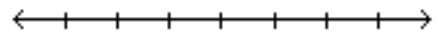


2. All real numbers at least 5 and at most 9

Regular notation: _____

Interval notation: _____

Graph:

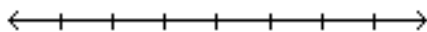


3. The circumference of a baseball is between 23 and 23.5 cm, inclusive.

Regular notation: _____

Interval notation: _____

Graph:

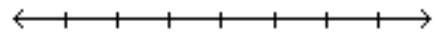


4. A tropical storm has wind speeds of at least 40 mph but less than 74 mph

Regular notation: _____

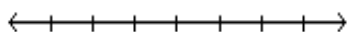
Interval notation: _____

Graph:

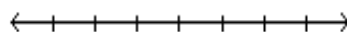


Solve each compound inequality and graph the solution and give the solution in interval notation:

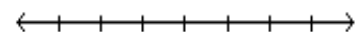
5. $3 \leq x + 2 \leq 7$



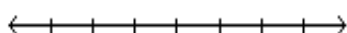
6. $2 < 3n - 4 \leq 14$



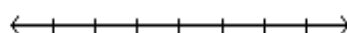
7. $4 > -3x + 7 > -2$



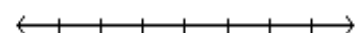
8. $-1 < 4m + 7 \leq 11$



9. $-7 \geq -3x + 8 > -16$



10. $-9 \leq -2m - 1 \leq -7$



Ex 3-5 Solving Compound Inequalities

Name _____

With "or"

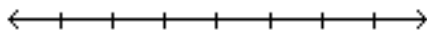
Date _____ Per _____

Write the compound inequality for each situation in both **regular notation**, then **graph** it.

1. All real numbers at most -2 **or** at least 3

Regular notation: _____

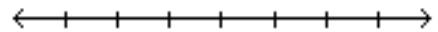
Graph:



2. All real numbers less than 4 **or** greater than 10

Regular notation: _____

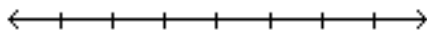
Graph:



3. Mr. Green sends notes home to students with grades less than 65% **or** at least 90%.

Regular notation: _____

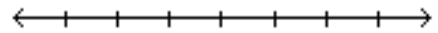
Graph:



4. Cops usually give tickets to cars on the freeway going less than 40 mph **or** more than 80 mph.

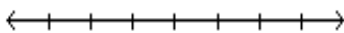
Regular notation: _____

Graph:

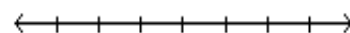


Solve each compound inequality and graph the solution:

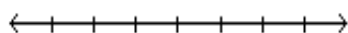
5. $3p - 1 < -7$ or $4p + 1 > 9$



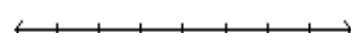
6. $4 + k > 3$ or $6k < -30$



7. $3x + 2 \leq -7$ or $-4x + 5 \leq 1$



8. $-2x + 7 > 3$ or $3x - 4 \geq 5$



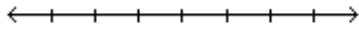
Solving Absolute Value Inequalities

Name _____

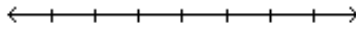
Date _____ Per _____

Solve and graph and give the final answers that would make the equation true.

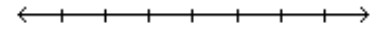
1. $|x| < 3$



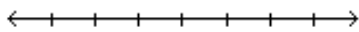
2. $|x| > 7$



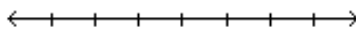
3. $|x| \leq 5$



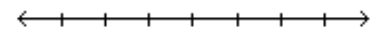
4. $2|x| - 1 > 3$



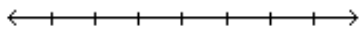
5. $-3|x| + 6 < -9$



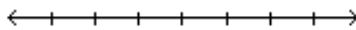
6. $-7|x| - 2 \geq -9$



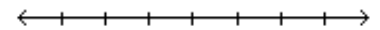
7. $|x + 2| \leq 6$



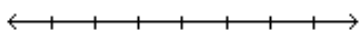
8. $|x - 5| > 2$



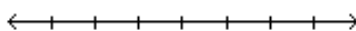
9. $|5x - 10| < 30$



10. $-6|x + 2| + 4 > -2$



11. $5|x - 3| - 8 \geq 2$



12. $-6|2x - 9| + 1 < -17$

