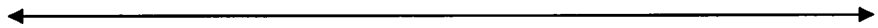
Blue: Writing and Graphing Inequalities

Name_____

1. a) That package must weigh at least 100 pounds!

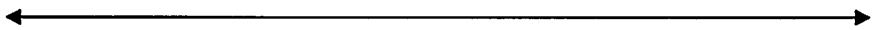


b) All of the fish in the tank have more than 20 spots but at most 50 spots

c) [-3 , 9]

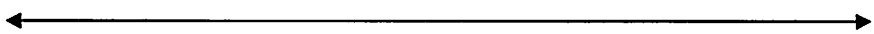
Name_____

2. a) The water temperature is less than 60 degrees.



b) I want my newborn to have a name that's at least 4 letters long but no more than 8 letters.

c) (5 , 7]



Name_____-

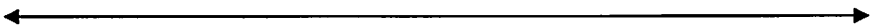
3. a) Joe has more than 7 cousins

b) You better get a grade between 80 and 100 inclusively on the next test.

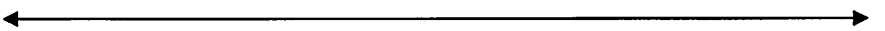
c) (-4 , 0)

Name_____

4. a) I've got no more than $50 in my pocket.



b) Jeremy walks more than 4 miles but less than 8 miles every week.



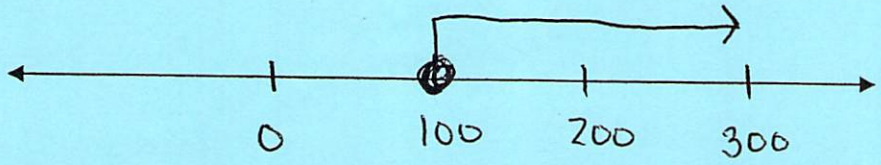
c) [7 , 10)

Blue: Writing and Graphing Inequalities

Name Key

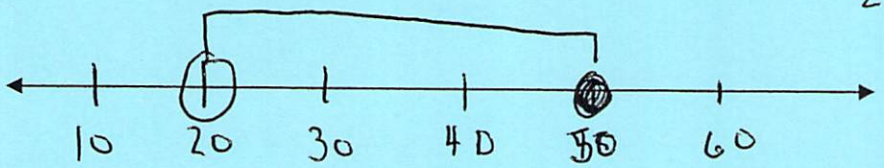
1. a) That package must weigh at least 100 pounds!

$x \geq 100$



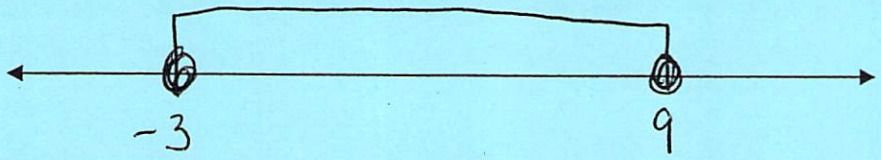
b) All of the fish in the tank have more than 20 spots but at most 50 spots

$20 < x \leq 50$



c) [-3, 9]

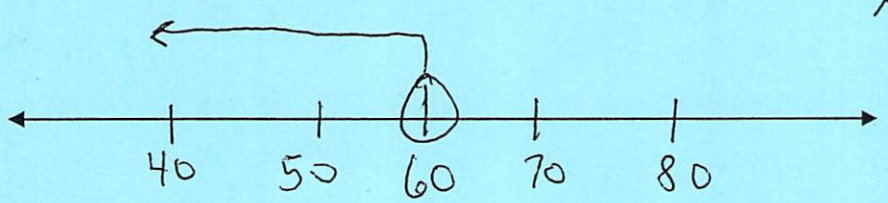
$-3 \leq x \leq 9$



Name Key

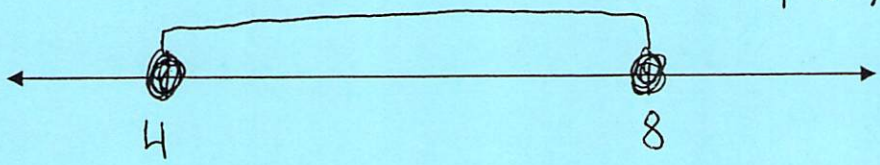
2. a) The water temperature is less than 60 degrees.

$x < 60$



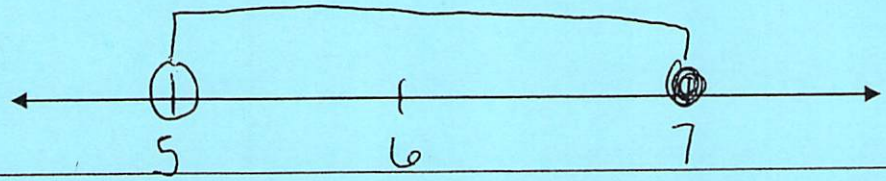
b) I want my newborn to have a name that's at least 4 letters long but no more than 8 letters.

$4 \leq x \leq 8$



c) (5, 7]

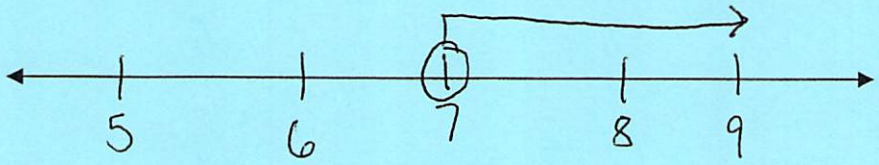
$5 < x \leq 7$



Name Key

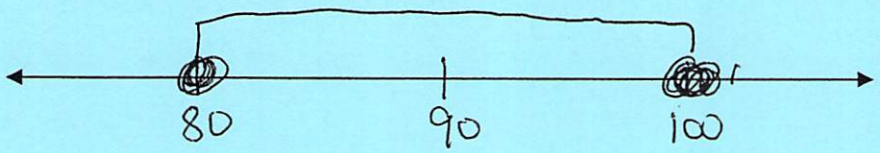
3. a) Joe has more than 7 cousins

$x > 7$



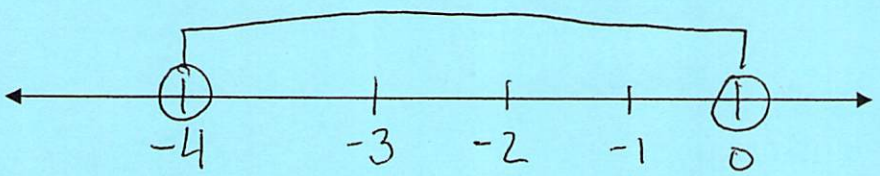
b) You better get a grade between 80 and 100 inclusively on the next test.

$80 \leq x \leq 100$



c) (-4 , 0)

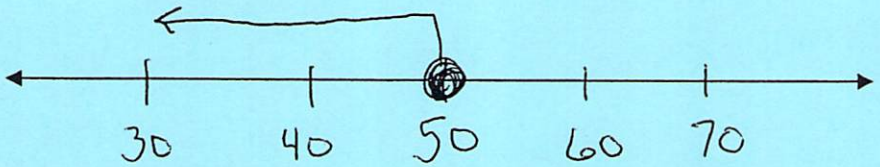
$-4 < x < 0$



Name Key

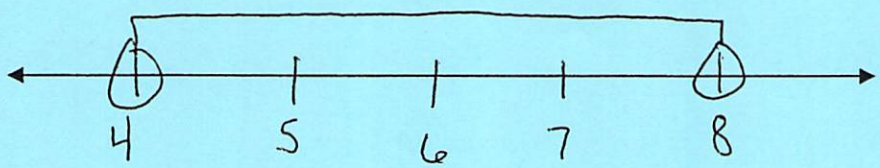
4. a) I've got no more than $50 in my pocket.

$x \leq 50$



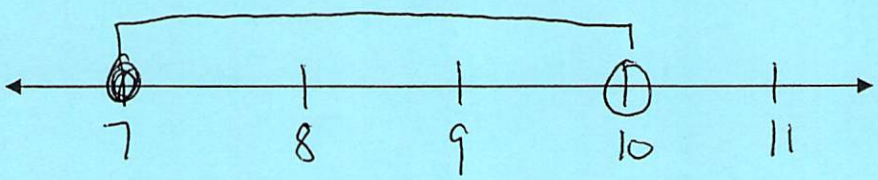
b) Jeremy walks more than 4 miles but less than 8 miles every week.

$4 \leq x < 8$



c) [7 , 10)

$7 \leq x < 10$



Green: Solving Inequalities

Name_____

1. (a) Which of the following is a solution to the inequality: $-2x + 5 > 11$

(1) 4 (2) 0 (3) -3 (4) -5

(b) Which of the following is **NOT** a solution to the inequality: $-\frac{x}{7} \geq -3$

(1) 21 (2) 20 (3) -21 (4) 24

Name_____

2. (a) Which of the following is **NOT** a solution to the inequality: $-7x + 9 \leq -19$

(1) -4 (2) 4 (3) 5 (4) 6

(b) Which of the following is a solution to the inequality: $-\frac{x}{2} > 5$

(2) 10 (2) -10 (3) -15 (4) 15

Name_____

3. (a) Which of the following is a solution to the inequality: $-4x + 3 < -1$

(1) -1 (2) 1 (3) -2 (4) 2

(b) Which of the following is **NOT** a solution to the inequality: $-\frac{x}{6} \leq 1$

(1) -6 (2) 20 (3) 35 (4) -24

Name_____

4. (a) Which of the following is **NOT** a solution to the inequality: $-x + 6 \leq 3$

(2) 3 (2) -3 (3) 4 (4) 25

(b) Which of the following is **NOT** a solution to the inequality: $-\frac{x}{8} > -5$

(2) 38 (2) 39 (3) -40 (4) 41

Green: Solving Inequalities

Name Key

1. (a) Which of the following is a solution to the inequality: $-2x + 5 > 11$

$-5 \quad -5$

$\frac{-2x}{-2} > \frac{6}{-2}$

$x < -3$

(1) 4 (2) 0 (3) -3 (4) -5

(b) Which of the following is **NOT** a solution to the inequality: $-7, -\frac{x}{7} \geq -3 \cdot -7$

$x \leq 21$

(1) 21 (2) 20 (3) -21 (4) 24

Name Key

2. (a) Which of the following is **NOT** a solution to the inequality: $-7x + 9 \leq -19$

$-9 \quad -9$

$\frac{-7x}{-7} \leq \frac{-28}{-7}$

$x \geq 4$

(1) -4 (2) 4 (3) 5 (4) 6

(b) Which of the following is a solution to the inequality: $-2, -\frac{x}{2} > 5 \cdot -2$

$x < -10$

(2) 10 (2) -10 (3) -15 (4) 15

Name Key

3. (a) Which of the following is a solution to the inequality: $-4x + 3 < -1$

$-3 \quad -3$

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

$x > 1$

(1) -1 (2) 1 (3) -2 (4) 2

(b) Which of the following is **NOT** a solution to the inequality: $-6 \cdot -\frac{x}{6} \leq 1 \cdot -6$

$x \geq -6$

(1) -6 (2) 20 (3) 35 (4) -24

Name Key

4. (a) Which of the following is **NOT** a solution to the inequality: $-x + 6 \leq 3$

$-6 \quad -6$

$\frac{-x}{-1} \leq \frac{-3}{-1}$

$x \geq 3$

(2) 3 (2) -3 (3) 4 (4) 25

(b) Which of the following is **NOT** a solution to the inequality: $-8 \cdot -\frac{x}{8} > -5 \cdot -8$

$x < 40$

(2) 38 (2) 39 (3) -40 (4) 41

Yellow: Multi-Step Inequalities

Name_____

1. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$5(-2+x) < 3x+2$$

Name_____

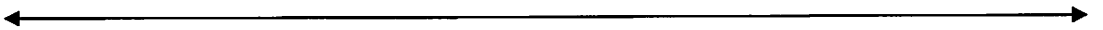
2. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$-7(x+1) > -9-5x$$

Name_____

3. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

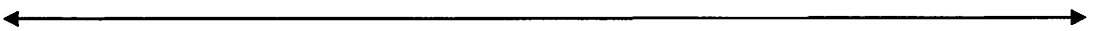
$$5 + 4x \geq x + 8$$



Name_____

4. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$-30 + 5x \leq 4(8x + 6)$$



Yellow: Multi-Step Inequalities

Name Key

1. Solve and Graph your solution set.

$5(-2+x) < 3x+2$

$-10+5x < 3x+2$

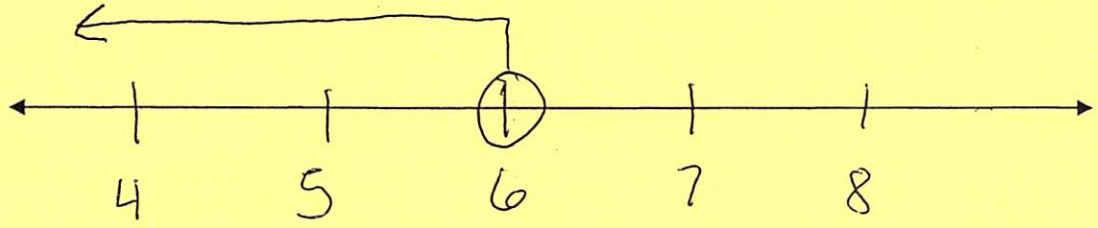
$+10 \qquad +10$

$5x < 3x+12$

$-3x \quad -3x$

$\frac{2x}{2} < \frac{12}{2}$

$x < 6$



Name Key

2. Solve and Graph your solution set.

$-7(x+1) > -9-5x$

$-7x-7 > -9-5x$

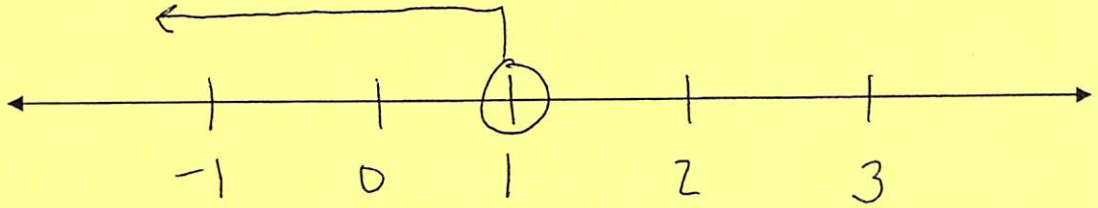
$+7x \qquad +7x$

$-7 > -9+2x$

$+9 \quad +9$

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

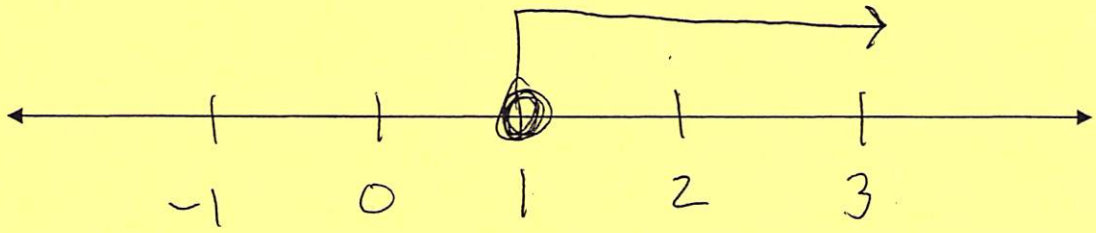
$1 > x$ or $x < 1$



Name Key

3. Solve and Graph your solution set.

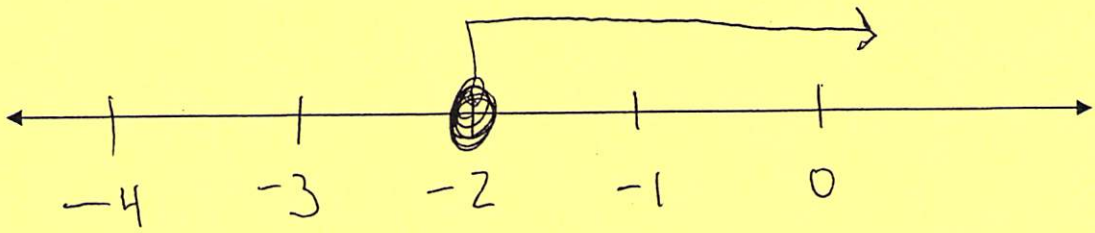
$$5 + 4x \geq x + 8$$
$$-x \quad\quad -x$$
$$5 + 3x \geq 8$$
$$-5 \quad\quad -5$$
$$\frac{3x}{3} \geq \frac{3}{3}$$
$$x \geq 1$$



Name Key

4. Solve and Graph your solution set.

$$-30 + 5x \leq 4(8x + 6)$$
$$-30 + 5x \leq 32x + 24$$
$$-5x \quad\quad -5x$$
$$-30 \leq 27x + 24$$
$$-24 \quad\quad -24$$
$$\frac{-54}{27} \leq \frac{27x}{27}$$
$$-2 \leq x \quad \text{or} \quad x \geq -2$$



Pink: Inequalities Word Problems

Name_____

Write and Solve an Inequality

1. Leah estimates she needs $165 to buy a new lacrosse stick. She has $75 saved. Her father agreed to pay her $8 an hour for gardening. What is the minimum number of hours Leah must work at gardening to earn $165?

Name_____

Write and Solve an Inequality

2. Beth wanted to go to the school dance but only had $25 to spend. If the ticket cost $5 how many cookies could Beth buy at the dance if each cookie costs $1.25?

Name_____

Write and Solve an Inequality

3. George wanted to start his own painting business. He bought a ladder and some supplies for $180. He plans on charging $10 per hour painting. How many hours will George have to work if he is to make at least a profit of $750?

Name_____

Write and Solve an Inequality

4. Peter begins his kindergarten year able to spell 10 words. He is going to learn to spell 2 new words every day. Write an inequality to determine the minimum number of whole days it will take for him to be able to spell *at least* 75 words.

Pink: Inequalities Word Problems

Name Key

Write and Solve an Inequality

1. Leah estimates she needs $165 to buy a new lacrosse stick. She has $75 saved. Her father agreed to pay her $8 an hour for gardening. What is the minimum number of hours Leah must work at gardening to earn $165?

Let h = hours spent gerdening

$165 \leq 75 + 8h$

$-75 \quad -75$

$\frac{90}{8} \leq \frac{8h}{8}$

$11.25 \leq h$

She must spend 12 hours gerdening

Name _____

Write and Solve an Inequality

2. Beth wanted to go to the school dance but only had $25 to spend. If the ticket cost $5 how many cookies could Beth buy at the dance if each cookie costs $1.25?

Let c = cookies bought

$25 \geq 5 + 1.25c$

$-5 \quad -5$

$\frac{20}{1.25} \geq \frac{1.25c}{1.25}$

$16 \geq c$

Beth can buy 16 cookies or less

Name_____

Write and Solve an Inequality

3. George wanted to start his own painting business. He bought a ladder and some supplies for $180. He plans on charging $10 per hour painting. How many hours will George have to work if he is to make at least a profit of $750?

Let h = hours painting

$-180 + 10h \geq 750$

$+180 \qquad +186$

$\frac{10h}{10} \geq \frac{930}{10}$

$h \geq 93$

George will have to work 93 hours or more

Name_____

Write and Solve an Inequality

4. Peter begins his kindergarten year able to spell 10 words. He is going to learn to spell 2 new words every day. Write an inequality to determine the minimum number of whole days it will take for him to be able to spell *at least* 75 words.

Let d = days of learning words

$10 + 2d \geq 75$

$-10 \qquad -10$

$\frac{2d}{2} \geq \frac{65}{2}$

$d \geq 32.5$

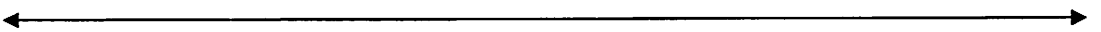
It will take Peter atleast 33 days

Purple: Compound Inequalities

Name_____

1. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

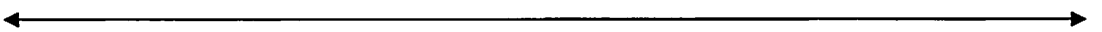
$$6 < \frac{-3(x+7)}{4} \leq 18$$



Name_____

2. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$\frac{5x-9}{4} > 2x \quad or \quad \frac{2}{3}x - 1 > 5$$



Name_____

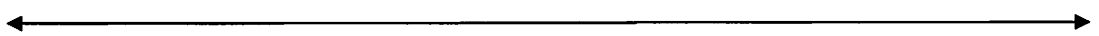
3. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$-3 \leq \frac{1}{2}(x+3) \leq 9$$

Name_____

4. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$4\frac{1}{5}x + 48 \leq x \qquad or \qquad \frac{x+5}{4} < 2(x+12)$$



Purple: Compound Inequalities

Name_____

1. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$4 \cdot 6 < \frac{-3(x+7)}{4} \leq 18 \cdot 4$$

$\cdot 4$

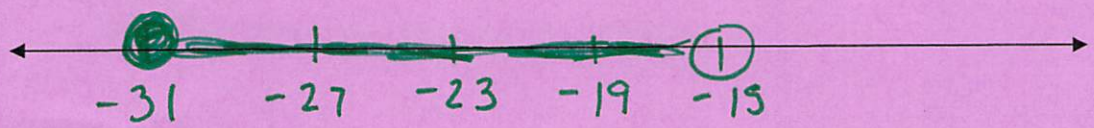
$$\frac{24}{-3} < \frac{-3(x+7)}{-3} \leq \frac{72}{-3}$$

$$-8 > x+7 \geq -24$$

$$-7 \quad -7 \quad -7$$

$$-15 > x \geq -31$$

$[-31, -15)$



Name_____

2. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$4 \cdot \frac{5x-9}{4} > 2x \cdot 4 \quad or \quad \frac{2}{3}x - 1 > 5$$

$+1 \quad +1$

$$5x - 9 > 8x$$

$$-5x \quad -5x$$

$$\frac{-9}{3} > \frac{3x}{3}$$

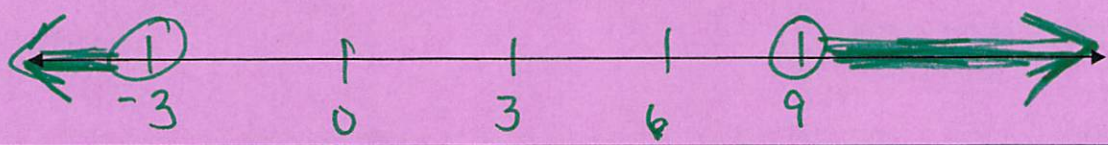
$$-3 > x$$

or

$$\frac{3}{2} \cdot \frac{2}{3}x > 6 \cdot \frac{3}{2}$$

$$x > 9$$

$(-\infty, -3) \cup (9, \infty)$



Name_____

3. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$-3 \le \frac{1}{2}(x+3) \le 9$$

$-3 \le \frac{1}{2}x + \frac{3}{2} \le 9$

$-\frac{3}{2} \quad -\frac{3}{2} \quad -\frac{3}{2}$

$-4\frac{1}{2} \le \frac{1}{2}x \le 7\frac{1}{2}$

$\cdot 2 \quad \cdot 2$

$-9 \le x \le 15$ $\quad [-9, 15]$

Name_____

4. Solve and Graph your solution set. Write Your Solution Set in Interval Notation

$$4\frac{1}{5}x + 48 \le x \quad or \quad \frac{x+5}{4} < 2(x+12)$$

$-x \quad -x$

$\frac{5}{16} \cdot \frac{16}{5}x \le -48 \cdot \frac{5}{16}$

$x \le -15$ or

$(-\infty, -15]$

$x + 5 < 8(x+12)$

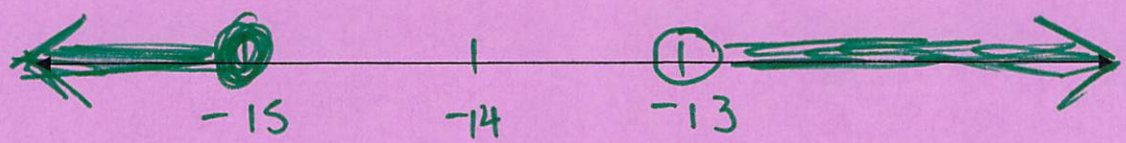
$x + 5 < 8x + 96$

$-7x < 91$

$\frac{-7x}{-7} < \frac{91}{-7}$

$x > -13$

$\cup \ (-13, \infty)$



White: Literal Inequalities

Name_____

1. Solve for x when $p < 0$ and b and g are both positive integers.

$$\frac{bx + gx}{p} > m$$

Name_____

2. Solve for m when $g < 0$

$$\frac{wh - gm}{3} \geq t$$

Name_____

3. Solve for r

$$A > \frac{1}{3}\pi r^2 h$$

Name_____

Solve for y when $x < b$

$$xy < by - t$$

White: Literal Inequalities

Name Key

1. Solve for x when $p < 0$ and b and g are both positive integers.

$$p \cdot \frac{bx + gx}{p} > m \cdot p$$

$$bx + gx < mp$$

$$\frac{x(b+g)}{(b+g)} < \frac{mp}{(b+g)}$$

$$\boxed{x < \frac{mp}{(b+g)}}$$

Name _____

2. Solve for m when $g < 0$

$$3 \cdot \frac{wh - gm}{3} \geq t \cdot 3$$

$$wh - gm \geq 3t$$

$$-wh \qquad\qquad -wh$$

$g < 0$

$\downarrow$

$-(-g)$

This will be positive

$\rightarrow$

$$\frac{-gm}{-g} \geq \frac{3t - wh}{-g}$$

$$m \geq \frac{3t - wh}{-g}$$

Name_____

3. Solve for r

$3 \cdot A > \frac{1}{3}\pi r^2 h \cdot 3$

$\frac{3A}{\pi h} > \frac{\pi r^2 h}{\pi h}$

$\sqrt{\frac{3A}{\pi h}} > \sqrt{r^2}$

$\boxed{\sqrt{\frac{3A}{\pi h}} > r}$

Name_____

Solve for y when $x < b$

$xy < by - t$

$-by \quad -by$

$xy - by < -t$

$y(x-b) < -t$

$\boxed{y > \frac{-t}{(x-b)}}$

Orange: Sets

Name_____

1. Set A = {x | x is a factor of 32}
   Set B = {2, 4, 6, 8, 10}

   (a) Find the intersection of A and B.

   (b) Find the union of A and B.

2. If the universal set, U = {January, February, March, April, May, June, July, August, September, October, November, December} and A={January, June, September, October}, write the complement of A.

Name_____

1. Set A = {x | x is a factor of 16}
   Set B = { x | x is a factor of 24}

   (a) Find the intersection of A and B.

   (b) Find the union of A and B.

2. If the universal set, U = {Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday} and A= {Saturday, Sunday}, write the complement of A.

Name_____

1. Set A = {x | x is a factor of 42}
   Set B = {1, 3, 5, 7, 9}

   (a) Find the intersection of A and B.

   (b) Find the union of A and B.

2. If the universal set, U = {apple, coconut, peach, blueberry, cherry, strawberry} and A={ apple, coconut, blueberry, cherry }, write the complement of A.

Name_____

1. Set A = {1, 3, 5, 7, 9}
   Set B = {2, 4, 6, 8, 10}

   (a) Find the intersection of A and B.

   (b) Find the union of A and B.

2. If the universal set, U = {soccer, basketball, football, lacrosse, hockey, golf, cheerleading} and A={lacrosse, hockey, golf }, write the complement of A.

Orange: Sets

Name Key

1. Set $A = \{x \mid x \text{ is a factor of } 32\}$ $\longrightarrow$ $\{1, 2, 4, 8, 16, 32\}$
   Set $B = \{2, 4, 6, 8, 10\}$

   (a) Find the intersection of A and B.

   $A \cap B = \{2, 4, 8\}$

   (b) Find the union of A and B.

   $A \cup B = \{1, 2, 4, 6, 8, 10, 16, 32\}$

2. If the universal set, U = {January, February, March, April, May, June, July, August, September, October, November, December} and A={January, June, September, October}, write the complement of A.

   $A' = \{$ February, March, April, May, July, August, November, December $\}$

Name Key

1. Set $A = \{x \mid x \text{ is a factor of } 16\}$ $\longrightarrow$ $\{1, 2, 4, 8, 16\}$
   Set $B = \{x \mid x \text{ is a factor of } 24\}$ $\{1, 2, 3, 4, 6, 8, 12, 24\}$

   (a) Find the intersection of A and B.

   $A \cap B = \{1, 2, 4, 8\}$

   (b) Find the union of A and B.

   $A \cup B = \{1, 2, 3, 4, 6, 8, 12, 16, 24\}$

2. If the universal set, U = {Monday, Tuesday, Wednesday, Thursday, Friday, Saturday, Sunday} and A= {Saturday, Sunday}, write the complement of A.

   $A' = \{$ Monday, Tuesday, Wednesday, Thursday, Friday $\}$

Name Key

1. Set $A = \{x \mid x \text{ is a factor of } 42\}$ $\longrightarrow$ $\{1, 2, 3, 6, 7, 12, 21, 42\}$
   Set $B = \{1, 3, 5, 7, 9\}$

   (a) Find the intersection of A and B.

   $A \cap B = \{1, 3, 7\}$

   (b) Find the union of A and B.

   $A \cup B = \{1, 2, 3, 5, 6, 7, 9, 12, 21, 42\}$

2. If the universal set, U = {apple, coconut, peach, blueberry, cherry, strawberry} and A={ apple, coconut, blueberry, cherry }, write the complement of A.

   $A' = \{$ peach, strawberry $\}$

Name Key

1. Set $A = \{1, 3, 5, 7, 9\}$
   Set $B = \{2, 4, 6, 8, 10\}$

   (a) Find the intersection of A and B.

   $A \cap B = \emptyset$

   (b) Find the union of A and B.

   $A \cup B = \{1, 2, 3, 4, 5, 6, 7, 8, 9, 10\}$

2. If the universal set, U = {soccer, basketball, football, lacrosse, hockey, golf, cheerleading} and A={lacrosse, hockey, golf }, write the complement of A.

   $A' = \{$ soccer, basketball, football, cheerleading $\}$