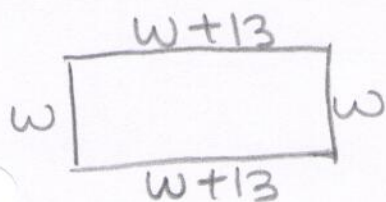


Work the following problems paying careful attention to formatting. One person from each group will hand in the work. Compare your answers and decide who will turn in this assignment for the group. Make sure each group member's name is on the sheet to be turned in! You must work as a group to earn credit. **No individual submissions.**

1. A basketball court is a rectangle with a perimeter of 86 meters. The length is 13 meters more than the width. Find the width and length of the basketball court. Define your variable and set up an algebraic equation. Show all of your work. Write your answer in a complete sentence.



Let w represent the width of the basketball court (in meters)

Then the width is $w+13$

Perimeter = length + length + width + width

$$86 = w+13 + w+13 + w + w$$

$$86 = 4w + 26$$

$$86 - 26 = 4w + 26 - 26$$

$$60 = 4w$$

$$\frac{60}{4} = \frac{4w}{4}$$

$$15 = w$$

So the length is $15+13=28$

The dimensions of the basketball court

are 15m by 28m.

2. Including 6% sales tax, a car sold for \$23,850. Find the price of the car before the tax was added. Define your variable and set up an algebraic equation. Show all of your work. Write your answer in a complete sentence.

Let P represent the price of the car before the sales tax (in dollars)

$$\text{Total price} = \text{original price} + \text{sales tax amount}$$

$$23,850 = P + 0.06P$$

$$23,850 = 1.06P$$

$$\frac{23,850}{1.06} = \frac{1.06P}{1.06}$$

$$22,500 = P$$

The price of the car before the tax was \$22,500.

3. Determine whether each statement is true or false. If the statement is false, make the necessary change(s) to produce a true statement.

a. Ten pounds less than Bill's weight, w , equals 160 pounds is modeled by $10 - w = 160$.

False

$$w - 10 = 160$$

b. After a 35% price reduction, a computer's price is \$780, so its original price, P , can be found by solving $P - 0.35 = 780$.

False

$$P - 0.35P = 780$$

c. If the length of a rectangle is 6 inches more than its width, and its perimeter is 24 inches, the distributive property must be used to solve the equation that determines the length.

False

The distributive property could be

used: $P = 2w + 2(w + 6)$

The distributive property doesn't have to be used:

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$$P = w + w + w + 6 + w + 6$$

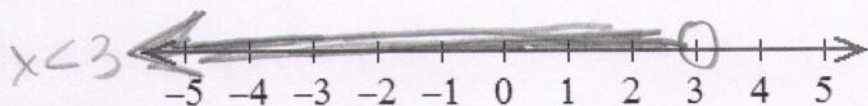
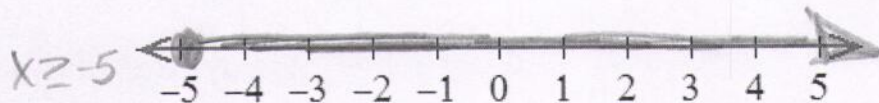
4. Express each inequality in interval notation and graph the interval.

a. $x \geq -5$

$[-5, \infty)$

b. $x < 3$

$(-\infty, 3)$



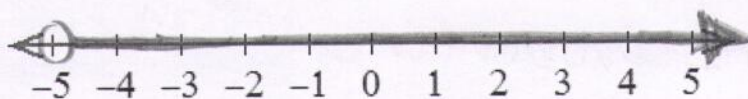
5. Solve $-3x < 15$ and graph the solution set on a number line. Write the solution set in interval notation.

$$-3x < 15$$

$$\frac{-3x}{-3} > \frac{15}{-3}$$

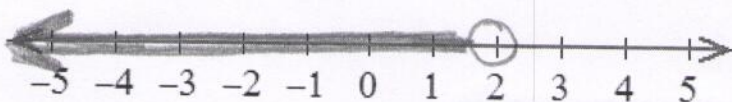
$$x > -5$$

$(-5, \infty)$



6. Solve $8x - 4 < 12$ and graph the solution set on a number line. Write the solution set in interval notation.

$$\begin{aligned}
 8x - 4 &< 12 \\
 8x - 4 + 4 &< 12 + 4 \\
 8x &< 16 \\
 \frac{8x}{8} &< \frac{16}{8} \\
 x &< 2 \\
 (-\infty, 2)
 \end{aligned}$$

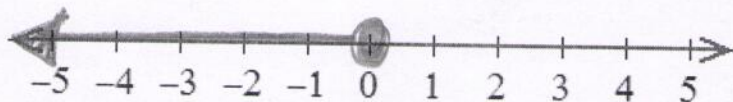


7. Solve $6x - 3 \leq 3(x - 1)$ and graph the solution set on a number line. Write the solution set in interval notation.

$$\begin{aligned}
 6x - 3 &\leq 3(x - 1) \\
 6x - 3 &\leq 3x - 3 \\
 6x - 3 + 3 &\leq 3x - 3 + 3 \\
 6x &\leq 3x \\
 6x - 3x &\leq 3x - 3x \\
 3x &\leq 0 \\
 \frac{3x}{3} &\leq \frac{0}{3}
 \end{aligned}$$

$$x \leq 0$$

$$(-\infty, 0]$$



8. Solve $1 - \frac{x}{2} < 3$ and graph the solution set on a number line. Write the solution set in interval notation.

$$1 - \frac{x}{2} < 3$$

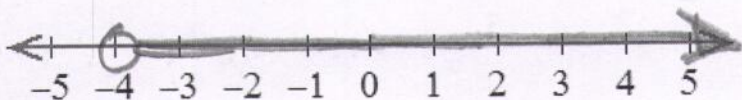
$$1 - \frac{x}{2} - 1 < 3 - 1$$

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

$$-2\left(-\frac{x}{2}\right) > -2(2)$$

$$x > -4$$

$$(-4, \infty)$$



9. Solve $3x + 1 \leq 3(x - 2)$

$$3x + 1 \leq 3(x - 2)$$

$$3x + 1 \leq 3x - 6$$

$$3x + 1 - 1 \leq 3x - 6 - 1$$

$$3x \leq 3x - 7$$

$$3x - 3x \leq 3x - 7 - 3x$$

$$0 \leq -7$$

False

There are no solutions.

10. Solve $5(x + 4) > 5x + 10$

$$5(x + 4) > 5x + 10$$

$$5x + 20 > 5x + 10$$

$$5x + 20 - 10 > 5x + 10 - 10$$

$$5x + 10 > 5x$$

$$5x + 10 - 5x > 5x - 5x$$

$$10 > 0 \text{ True}$$

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Every real number is a solution.