Solve the equation.

1. $x + 1 = 0$

$-1 \quad -1$

$x = -1$

2. $y - 3 = 0$

$+3 \quad +3$

$y = 3$

3. $x - 3 = 3$

$+3 \quad +3$

$x = 6$

$x - 5 + 5 = 2 + 5$

$x = 7$

4. $x + 1 = -1$

$-1 \quad -1$

$x = -2$

5. $a + 5 = -15$

$-5 \quad -5$

$a = -20$

6. $x - 5 = 2$

$+5 \quad +5$

$x = 7$

Solve the equation.

1. $|x - 7| = 6$

2. $|3 - x| = 7$

3. $|4x + 1| = 2$

4. $|4x + 3| = 5$

5. $|m - 4| = 6$

6. $|q + 9| = 13$

Essential Question

How can you use addition or subtraction to solve an inequality?

Work with a partner. The National Collegiate Athletic Association (NCAA) uses the following formula to rank the passing efficiencies P of quarterbacks.

$$P = \frac{8.4Y + 100C + 330T - 200N}{A}$$

Y = total length of all completed passes (in Yards)

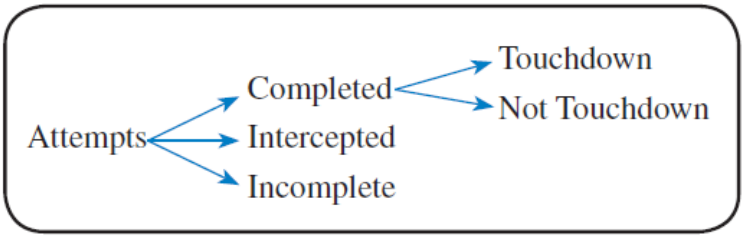
C = Completed passes

T = passes resulting in a Touchdown

N = iNtercepted passes

A = Attempted passes

M = incoMplete passes



Determine whether each inequality must be true. Explain your reasoning.

a. $T < C$ **b.** $C + N \leq A$ **c.** $N < A$ **d.** $A - C \geq M$

Work with a partner. Use the passing efficiency formula to create a passing record that makes each inequality true. Record your results in the table. Then describe the values of P that make each inequality true.

Attempts	Completions	Yards	Touchdowns	Interceptions

a. $P < 0$

b. $P + 100 \geq 250$

c. $P - 250 > -80$

Core Concept

Addition Property of Inequality

Words Adding the same number to each side of an inequality produces an equivalent inequality.

Numbers

$$\begin{array}{rcl} -3 & < & 2 \\ \underline{+4} & & \underline{+4} \\ 1 & < & 6 \end{array} \qquad \begin{array}{rcl} -3 & \geq & -10 \\ \underline{+3} & & \underline{+3} \\ 0 & \geq & -7 \end{array}$$

Algebra If $a > b$, then $a + c > b + c$. If $a \geq b$, then $a + c \geq b + c$.

If $a < b$, then $a + c < b + c$. If $a \leq b$, then $a + c \leq b + c$.

Solve $x - 6 \geq -10$. Graph the solution.

+6 +6 Addition Property of Inequality

$x \geq -4$

Solve the inequality. Graph the solution.

1. $b - 2 > -9$

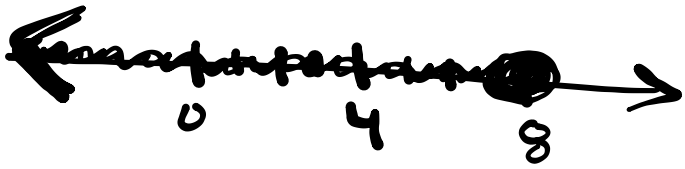
+2 +2

$b > -7$

2. $m - 3 \leq 5$

+3 +3

$m \leq 8$



Core Concept

Subtraction Property of Inequality

Words Subtracting the same number from each side of an inequality produces an equivalent inequality.

Numbers

$$\begin{array}{rcl} -3 & \leq & 1 \\ -5 & & -5 \\ \hline -8 & \leq & -4 \end{array} \qquad \begin{array}{rcl} 7 & > & -20 \\ -7 & & -7 \\ \hline 0 & > & -27 \end{array}$$

Algebra If $a > b$, then $a - c > b - c$. If $a \geq b$, then $a - c \geq b - c$.

If $a < b$, then $a - c < b - c$. If $a \leq b$, then $a - c \leq b - c$.

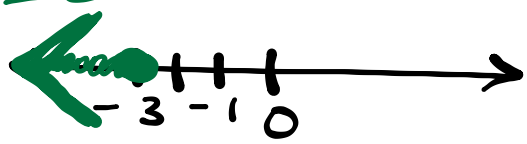
Solve each inequality. Graph the solution.

a. $y + 8 \leq 5$

$-8 \quad -8$

$y \leq -3$

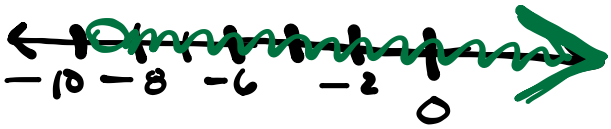
$-\infty$



b. $-8 < 1.4 + m$

$-1.4 \quad -1.4$

$-3 \geq y \quad -9.4 < m$



Solve the inequality. Graph the solution.

4. $k + 5 \leq -3$ **5.** $\frac{5}{6} \leq z + \frac{1}{6}$ **6.** $p + 0.7 > -2.3$

A circuit overloads at 1800 watts of electricity. You plug a microwave oven that uses 1100 watts of electricity into the circuit.

a. Write and solve an inequality that represents how many watts you can add to the circuit without overloading the circuit.

b. In addition to the microwave oven, which of the following appliances can you plug into the circuit at the same time without overloading the circuit?

Appliance	**Watts**
Clock radio	50
Blender	300
Hot plate	1200
Toaster	80

7. The microwave oven uses only 1000 watts of electricity. Does this allow you to have both the microwave oven and the toaster plugged into the circuit at the same time? Explain your reasoning.

Think-Pair-Share: Solve and graph.

$x + 3.8 \leq -9$

$$\frac{2}{5} > x - \frac{3}{4}$$