Inequalities with Negative Coefficients Homework

1) Given the initial inequality \(2 > -4\), identify which operation preserves the inequality symbol and which operation reverses the inequality symbol. Write the new inequality after the operation is performed. The first one is done for you.

   a. Multiply both sides by \(-2\).
      
      *Inequality symbol is reversed.*
      
      \[
      \begin{align*}
      2 &> -4 \\
      2(-2) &< -4(-2) \\
      -4 &< 8
      \end{align*}
      \]

   b. Add \(-2\) to both sides.

   c. Divide both sides by \(2\).

   d. Multiply both sides by \(-\frac{1}{2}\).

   e. Subtract \(-3\) from both sides.

2) For each problem, use the properties of inequalities to write a true inequality statement.
   Two integers are \(-2\) and \(-5\).
   
   a. Write a true inequality statement.
      
      \[-2 > -5\]

   b. Subtract \(-2\) from each side of the inequality. Write a true inequality statement.
      
      \[-4 > -7\]

   c. Multiply each number by \(-3\). Write a true inequality statement.
      
      \[12 < 21\]
      
      Flips direction
3. On a recent vacation to the Caribbean, Kay and Tony wanted to explore the ocean elements. One day they went in a submarine 150 feet below sea level. The second day they went scuba diving 75 feet below sea level.
   a. Write an inequality comparing the submarine’s elevation and the scuba diving elevation.

   b. If they only were able to go one-fifth of the capable elevations, write a new inequality to show the elevations they actually achieved.

   c. Was the inequality symbol preserved or reversed? Explain.

4) \(-4(4 + x) > 56\)

\[
\begin{align*}
16 - 4x &> 56 \\
-16 &-16 \\
-4x &> 40 \\
x &< -10 \\
\end{align*}
\]

5) \(-b - 2 > 8\)

\[
\begin{align*}
-1b - 2 &> 8 \\
+2 &+2 \\
-1b &> 10 \\
b &< -10 \\
\end{align*}
\]

6) \(-4(3 + n) > -32\)

\[
\begin{align*}
-12 - 4n &> -32 \\
+12 &+12 \\
-4n &> -20 \\
n &< 5 \\
\end{align*}
\]

7) \(4 + \frac{n}{3} < 6\)

\[
\begin{align*}
4 + \frac{n}{3} &< 6 \\
-4 &-4 \\
\frac{n}{3} &< 2 \\
n &< 6 \\
\end{align*}
\]
AIM: How do we solve inequalities?

How do we graph inequalities?

Do Now: Answer the questions above.

How many possible answers does an inequality have?

Homework: None
\[-2x + 5 < 7\]
\[-5 - 5\]
\[-2x < 2\]
\[-1 < \frac{-2}{x}\]

\[x > -1\]
If you found:

\[ 2x + 4 > 8 \]

\[ -3b - 3.5 \geq -9.5 \]

\[ 5 + k + -2 \geq 4 \]

\[ 10 \leq -2g + 20 \]
-40 < 5(g - 7)

\( \frac{b}{2} - 6 > -8 \)

5 - 5z ≤ 15

90 + 10m > 140
If you found:

\[ \frac{y}{3} - 4 \geq -5 \]

If you found:

\[ -2w > 10 \]

If you found:

\[ 2f + 5 > 13 \]

If you found:

\[ -4 + \frac{p}{3} \leq -3 \]
If you found:

10x + 2 > 2

If you found:

26 - 4z ≥ 10

If you found:

7 > 6 + \( \frac{h}{4} \)

If you found:

3p + 12 < 12
Inequality Scavenger Hunt

Directions: Write the inequality problem from the task card. Solve and graph each inequality.

1. 
-5 -4 -3 -2 -1 0 1 2 3 4 5

2. 
-5 -4 -3 -2 -1 0 1 2 3 4 5

3. 
-5 -4 -3 -2 -1 0 1 2 3 4 5

4. 
-5 -4 -3 -2 -1 0 1 2 3 4 5

5. 
-5 -4 -3 -2 -1 0 1 2 3 4 5

6. 
-5 -4 -3 -2 -1 0 1 2 3 4 5

7. 
-5 -4 -3 -2 -1 0 1 2 3 4 5

8. 
-5 -4 -3 -2 -1 0 1 2 3 4 5
While graphing solutions on the number line, you can use > or ≥. Explain the difference between the two?
Inequality Scavenger Hunt

Directions: Write the inequality problem from the task card. Solve and graph each inequality.

1. \[2x + 4 > 8\] \[\text{Answer} \quad x > 2\]

2. \[3b + 3.5 \leq 9.5\] \[\text{Answer} \quad b \leq 2\]

3. \[5 + k + (-2) \geq 4\] \[\text{Answer} \quad k \geq 1\]

4. \[46 \geq 3g + 31\] \[\text{Answer} \quad 5 \geq g\]

5. \[-40 < 5g - 35\] \[\text{Answer} \quad -1 < g\]

6. \[\frac{b}{2} - 6 > -8\] \[\text{Answer} \quad b > -4\]

7. \[5z - 5 \geq -15\] \[\text{Answer} \quad z \geq -2\]

8. \[90 + 10m > 140\] \[\text{Answer} \quad m > 5\]