Unit 6: Inequalities

Pre-Algebra: Practice Test

6.1: I can solve and graph one-step inequalities with addition and subtraction.

1. \( x + 8 > 4 \)
   \[
   \begin{align*}
   x &> -4 \\
   \end{align*}
   \]

2. \( p - 6 \leq -3 \)
   \[
   \begin{align*}
   p &\leq 3 \\
   \end{align*}
   \]

3. \( k - 14 \leq -10 \)
   \[
   \begin{align*}
   k &\leq 4 \\
   \end{align*}
   \]

4. \( s + 1 \geq -5 \)
   \[
   \begin{align*}
   s &\geq -6 \\
   \end{align*}
   \]

Score: 8pts %

6.2: I can solve and graph one-step inequalities with multiplication and division.

1. \( -6x < 24 \)
   \[
   \begin{align*}
   x &> -4 \\
   \end{align*}
   \]

2. \( 4x \geq -16 \)
   \[
   \begin{align*}
   x &\geq -4 \\
   \end{align*}
   \]

3. \( \frac{x}{2} \leq 3 (2) \)
   \[
   \begin{align*}
   x &\leq 6 \\
   \end{align*}
   \]

4. \( 1 > -\frac{x}{3} (-3) \)
   \[
   \begin{align*}
   -3 &< x \\
   \end{align*}
   \]

Score: 8pts %
6.3: I can solve multiple-step inequalities.

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<table>
<thead>
<tr>
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<tbody>
<tr>
<td>1.</td>
<td>( \frac{5}{2} + x - 9 \geq 4 )</td>
</tr>
<tr>
<td></td>
<td>( x \geq 8 )</td>
</tr>
<tr>
<td>2.</td>
<td>( \frac{-3x+6}{-5} \leq -3 )</td>
</tr>
<tr>
<td></td>
<td>* switch sign twice</td>
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<tr>
<td>3.</td>
<td>(-8(x + 3) \leq 16 )</td>
</tr>
<tr>
<td></td>
<td>( x \geq -5 )</td>
</tr>
<tr>
<td>4.</td>
<td>( 3x - 7x + 2 &lt; 10 - 12 )</td>
</tr>
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<td></td>
<td>* switch sign</td>
</tr>
<tr>
<td>5.</td>
<td>( \frac{2x-1}{3} \geq 1(3) )</td>
</tr>
<tr>
<td></td>
<td>( x \geq 2 )</td>
</tr>
<tr>
<td>6.</td>
<td>(-3(x - 4) + 2(x + 2) &gt; 15 )</td>
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<td>* switch sign</td>
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Write an inequality representing the graph provided.

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<tbody>
<tr>
<td>7.</td>
<td>[Graph with a circle at 4 and an open arrow to the left to 0 and an arrow to the right to 5]</td>
</tr>
<tr>
<td></td>
<td>( x \leq 4 )</td>
</tr>
<tr>
<td>8.</td>
<td>[Graph with a circle at -8 and an arrow to the right to -10 and an arrow to the right to 0]</td>
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<td></td>
<td>( x \geq -8 )</td>
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Score: \( 20 \) pts \( \% \)

6.4: I can solve inequalities that have variables on both sides.

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<table>
<thead>
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<tbody>
<tr>
<td>1.</td>
<td>( 2(x - 3) + 4 \geq x + 12 )</td>
</tr>
<tr>
<td></td>
<td>( x \geq 14 )</td>
</tr>
<tr>
<td>2.</td>
<td>( 3(4x - 1) \leq 12x + 25 )</td>
</tr>
<tr>
<td></td>
<td>( x \leq 2 )</td>
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6.4 Continued on the Next Page
3. \(-9(x + 2) < -6x - 3(x + 8)\)
   
   \[-9x - 18 < -6x - 3x - 24\]
   
   \[-9x - 18 < -9x - 24\]
   
   \[0x < -6\]
   
   \[x < -6\]

4. \(3(12 + 2x) + 10 < 10x + 6\)
   
   \[36 + 6x + 10 < 10x + 4\]
   
   \[6x + 46 < 10x + 4\]
   
   \[-4x < -40\]
   
   \[x > 10\]

Score: 12 pts

6.5: I can solve inequalities with fractions.

1. \(\frac{3}{5} x - \frac{11}{30} \geq -\frac{5}{6}\) \((30)\)
   
   \[\text{LCM} = 30\]
   
   \[18x - 11 \geq 25\]
   
   \[18x \geq 36\]
   
   \[x \geq \frac{2}{1}\]

2. \(-3 \frac{2}{15} < -1 + \frac{4}{3}n\) \((15)\)
   
   \[\text{LCM} = 15\]
   
   \[-47 \leq -15 + 20n\]
   
   \[-32 < 20n\]
   
   \[-1.6 < n\]

3. \(\frac{11}{4} x + 1 + \frac{5}{8} x < -\frac{13}{16}\) \((16)\)
   
   \[\text{LCM} = 16\]
   
   \[44x + 16 + 10x < -13\]
   
   \[54x < -29\]
   
   \[x < -\frac{29}{54}\]

4. \(-7n - \frac{18}{7} + 2 \frac{6}{7} \geq -\frac{137}{14}\) \((14)\)
   
   \[-7n - \frac{15}{7} + 2 \frac{20}{7} \geq -\frac{137}{14}\]
   
   \[-98n - 30 + 40 \geq -137\]
   
   \[-98n - 10 \geq -137\]
   
   \[-98n \geq -127\]
   
   \[n \leq 1.5\]

Score: 12 pts

6.6: I can solve story problems with inequalities.

1. Your club is in charge of making pins that students can buy to show their school spirit for the upcoming basketball game. You have made 225 pins so far, and you have only 2 hours left to make the rest of the pins. You need to make at least 400 pins. How many pins do you have to make per minute in order to reach your goal?

   \[
   m = \frac{225 + 120m}{2\text{ hrs} \times 120\text{ minutes}} \geq \frac{400}{-225}
   \]

   At least 2 pins per minute.

   \[
   \frac{120m}{120} \geq \frac{175}{120}
   \]

   \[
   m \approx 1.458
   \]

2. A car dealership sold 78 new cars and 65 used cars this year. The number of new cars sold by the dealership has been increasing by 6 cars each year. The number of used cars sold by the dealership has been decreasing by 4 cars each year. If these trends continue, in how many years will the number of new cars sold be more than twice the number of used cars sold?

   \[
   y = \# \text{ of years}
   \]

   \[
   78 + 6y > 2(65 - 4y)
   \]

   \[
   78 + 6y > 130 - 8y
   \]

   \[
   78 + 14y > 130
   \]

   \[
   14y > 52
   \]

   \[
   y > 3.7
   \]

3. An animal shelter has fixed weekly expenses of $750. Each animal in the shelter costs an additional $6 per week. During the summer months, the weekly expenses are at least $1170. How many animals are at the shelter in the summer in order for the expenses to be at least $1170 a week?

   \[
   x = \# \text{ of animals}
   \]

   \[
   750 + 6x \geq 1170
   \]

   \[
   6x \geq 420
   \]

   \[
   x \geq 70
   \]

Score: 9pts %