1.) Solve the inequality and name three solutions:
\[8r - (5r + 4) > -31\]
\[8r - 5r - 4 > -31\]
\[3r - 4 > -31\]
\[3r > -27\]
\[r > -9\]
\[1, 2, 3\]

2.) Solve the inequality:
\[-5(3x + 4) - 10x > 12(x - 9) + 3x\]
\[-15x - 20 - 10x > 12x - 108 + 3x\]
\[-25x - 20 > 15x - 108\]
\[+25x\]
\[0 > 40x - 108\]
\[+108\]
\[88 > 40x\]
\[\frac{88}{40} > x\]
\[2.2 > x\]
\[x < 2.2\]

3.) Convert the inequality from standard form to slope intercept form:
\[x - 3y < 6\]
\[-x\]
\[-3y < -x + 6\]
\[y > \frac{1}{3}x - 2\]
What are linear inequalities?

<table>
<thead>
<tr>
<th>LINEAR INEQUALITY</th>
<th>similar to linear equations but with an inequality symbol ( &lt;, &gt;, \leq, \geq )</th>
</tr>
</thead>
<tbody>
<tr>
<td>SOLUTION to a Linear Inequality</td>
<td>any coordinate point that makes the inequality true</td>
</tr>
</tbody>
</table>

Algebraically

<table>
<thead>
<tr>
<th>EXAMPLE</th>
<th>Determine which ordered pairs are solutions to the linear inequality below: ( 2x - 3y &lt; 15 )</th>
</tr>
</thead>
</table>
|         | \( (2, 5) \) \[ 2(2) - 3(5) \leq 15 \]
|         | \( (-1, -7) \) \[ 2(-1) - 3(-7) \leq 15 \] \[ -2 + 21 \leq 15 \] \[ 19 \leq 15 \] \[ \times \] \[ \text{No} \] |
|         | \( (3, -4) \) \[ 2(3) - 3(-4) \leq 15 \] \[ 6 + 12 \leq 15 \] \[ 18 \leq 15 \] \[ \times \] \[ \text{No} \] |
|         | \( (0, 0) \) \[ 2(0) - 3(0) \leq 15 \] \[ 0 \leq 15 \] \[ \checkmark \] \[ \text{Yes} \] |

Graphically

Graphing Linear Inequalities

Graphing linear inequalities is a way to show all the ordered pairs that are solutions. Steps to graph:

- **Step 1:** Put the inequality in **slope-intercept** form. Be sure to flip the inequality symbol if you multiply or divide by a negative number!

- **Step 2:** Graph the line:
  - Use a solid line for \( \leq \) or \( \geq \) symbols.
  - Use a dashed line for \( < \) or \( > \) symbols.

- **Step 3:** Shade:
  - Above the line for \( > \) or \( \geq \) symbols.
  - Below the line for \( < \) or \( \leq \) symbols.

Example: \( 2x - 3y \leq 15 \)

\[
\begin{align*}
-2x &\leq -3y + 15 \\
3y &\geq 2x + 15 \\
y &\geq \frac{2}{3}x - 5
\end{align*}
\]
Graph the inequalities. Write three possible solutions.