Directions: Please answer the following questions and make sure your answer are legible. You must show your work to receive credit for your answers. You may not use a calculator (or any other technology) on this quiz. Good Luck.

1. (6 points) How much water must be evaporated from 240 gallons of a 3% salt solution to produce a 5% salt solution? (#42 in 1.7)

   Answers with no work, incorrect work, or arrived at through 'guess and check' will receive 0’s.

<table>
<thead>
<tr>
<th>Before Evap</th>
<th>% Salt</th>
<th>Total Volume</th>
<th>Volume of Salt</th>
<th>% Salt after Evap</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3%</td>
<td>240</td>
<td>.03 * 240</td>
<td>.05 * (240-x)</td>
</tr>
<tr>
<td>After Evap</td>
<td>5%</td>
<td>240-x</td>
<td>.05 * (240-x)</td>
<td></td>
</tr>
</tbody>
</table>

   \[
   \text{Let } x = \text{volume of } H_2O \text{ to evaporate.}
   \]

   \[
   \text{amt of salt before evap} = \text{amt of salt after evap}
   \]

   \[
   .03 * 240 = .05 (240-x)
   \]

   \[
   3 * 240 = 5(240-x)
   \]

   \[
   240 = 5(240-x)
   \]

   \[
   x = \frac{-480}{-5}
   \]

   \[
   96 = x
   \]

   There is a question on the back!
2. (8 points) Solve each inequality, express your answer in interval notation.

1. \(|x - 2| + 2 < 3\)  \((\#39 \text{ in } 1.6)\)
2. \(|1 - 2x| > 3\)  \((\#47 \text{ in } 1.6)\)

\[
\begin{align*}
| x - 2 | & < 1 \\
-1 & < x - 2 < 1 \\
1 & < x < 3 \\
\boxed{(1, 3)}
\end{align*}
\]

\[
\begin{align*}
11 - 2x & > 3 \\
1 - 2x & < -3 \quad \text{or} \quad 1 - 2x > 3 \\
-2x & < -4 \quad \text{or} \quad -2x > 2 \\
x & > 2 \quad \text{or} \quad x < -1 \\
\boxed{(-\infty, -1) \cup (2, \infty)}
\end{align*}
\]

3. (6 points) Plot each point and form the triangle ABC. Verify that the triangle is a right triangle. Find its area.  \((\#31 \text{ in } 2.1)\)

\[
A = (-5, 3); \quad B = (6, 0); \quad C = (5, 5)
\]

\[
\begin{align*}
\text{Check:} \quad (\sqrt{130})^2 + (\sqrt{104})^2 & = (\sqrt{36})^2 \\
130 & = 104 + 26 \checkmark
\end{align*}
\]

\[
\begin{align*}
\text{Area} = \sqrt{104} \cdot \sqrt{36} = \sqrt{104 \cdot 36} = \sqrt{3744} = \sqrt{36} = 6
\end{align*}
\]