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. (8 points) Perform the indicated operations and simplify.
   \[
   \begin{align*}
   (a) \quad \frac{\frac{2}{3} - \frac{4}{5}}{4 - \frac{7}{10}} &= \frac{\frac{2}{3} - \frac{4}{5}}{\frac{40 - 7}{10}} = \frac{2 - \frac{24}{15}}{\frac{33}{10}} = \frac{-\frac{2}{15}}{\frac{33}{10}} = -\frac{2}{15} \cdot \frac{10}{33} = -\frac{22}{99} \\
   (b) \quad (-8)^{2/3} - 9^{3/2} &= (\sqrt[3]{-8})^2 - \sqrt[2]{9^3} = (-2)^2 - 9 = 4 - \frac{9}{3} = \frac{10}{3} \\
   (c) \quad (x - \sqrt[3]{5})(x^2 + x\sqrt[3]{5} + \sqrt[3]{25}) &= x^3 + x^2\sqrt[3]{5} + x\sqrt[3]{25} - x^2\sqrt[3]{5} - x\sqrt[3]{25} - \sqrt[3]{125} = x^3 - 5
   \end{align*}
   \]

2. (4 points) Solve the equation \( \frac{49w - 14}{7} = 3w - (2 - 4w) \).
   \[
   \begin{align*}
   49w - 14 &= 21w - 7(2 - 4w) \\
   49w - 14 &= 21w - 14 + 8w \\
   49w - 49w &= 0 \\
   0 &= 0 (\text{true}) \\
   \text{all real #}'s
   \end{align*}
   \]

Continued on the Back!
3. (4 points) Solve the equation \(|1 - \sqrt{2y}| = |y + 1|\). \hspace{1cm} (0.4 \# 15)

\[
1 - \sqrt{2y} = y + 1 \quad \text{or} \quad 1 - \sqrt{2y} = -(y + 1)
\]

\[
-\sqrt{2y} - y = 0 \quad \left\{ \begin{array}{l}
1 - \sqrt{2y} = -y - 1 \\
-\sqrt{2y} + y = -2 \\
(\sqrt{2} - 1)y = -2
\end{array} \right.
\]

\[
y = 0 \quad \text{or} \quad \frac{3}{\sqrt{2} - 1}
\]

4. (9 points) Solve the following inequalities. Write your answer in interval notation:

(a) \(-\frac{3}{2} \leq \frac{4 - 2t}{10} < \frac{7}{6}\) \hspace{1cm} (0.3 \# 39)

(b) \(2|7 - v| + 4 > 1\) \hspace{1cm} (0.4 \# 24)

\[
\text{a)} \quad -\frac{45}{30} \leq \frac{12 - 6t}{30} < \frac{35}{30}
\]

\[
-45 \leq 12 - 6t < 35
\]

\[
-57 \leq -6t < 23
\]

\[
-\frac{57}{6} \geq t > \frac{23}{6}
\]