MDE 010, Quiz #4, Summer 2023   Name _____ KEY _____

Instructions: Show all work. Give exact answers (improper fractions) and do no round unless specifically asked to do so. If you work the problem in your calculator you can write keystrokes to show work for partial credit.

1. Simplify each expression.

   a. $\frac{24}{-35} + -\frac{15}{49}$

   $\frac{-24}{35} + \frac{-15}{49} = \frac{-168}{245} - \frac{75}{245} = \frac{-243}{245}$

   $\quad 5 \cdot 7 \qquad 7 \cdot 7$

   b. $\left(-\frac{1}{7} \cdot \frac{23}{-27}\right) \cdot \left(-\frac{1}{9}\right) =$

   $\qquad\qquad 3$

   $\left(\frac{+23}{+3}\right) \cdot \left(-\frac{1}{9}\right) = -\frac{23}{27}$

   c. $-\frac{15}{22} + +\frac{31}{48} = \frac{-360}{528} + \frac{341}{528} = \frac{-19}{528}$

   $\quad 2 \cdot 11 \qquad 2 \cdot 24$

   d. $-\frac{13}{24} \div -\frac{39}{48} = \frac{-\overset{1}{\cancel{13}}}{\underset{1}{\cancel{24}}} \cdot \frac{-\overset{2}{\cancel{48}}}{\underset{3}{\cancel{39}}} = \frac{2}{3}$

2. Perform the following operations by hand.

   a. $\frac{5}{12} + \frac{11}{14} = \frac{35}{84} + \frac{66}{84} = \frac{101}{84} \quad \text{or} \quad 1\frac{17}{84}$

   $\quad 2 \cdot 6 \quad \cdot 2 \cdot 7$

   b. $\frac{9}{7} \cdot \frac{14}{27} \div \frac{10}{33} = \frac{\overset{1}{\cancel{9}}}{\cancel{7}} \cdot \frac{\overset{2}{\cancel{14}}}{\underset{1}{\cancel{27}}} \cdot \frac{\overset{11}{\cancel{33}}}{\underset{5}{\cancel{10}}} = \frac{11}{5}$

3. Explain why division into zero (ex. $\frac{0}{3}$) is equal to zero, but division by zero (ex. $\frac{3}{0}$) is not defined.

   Suppose $\frac{0}{3} = a$ is rearranged to a multiplication problem.
   $a \cdot 3 = 0$ clearly has a solution of 0 for a. But if we do the same for $\frac{3}{0}$ we get $0 \cdot a = 3$, but no # times 0 can ever be equal to 3.