1. [8 pts] Find two different decimal numbers that simultaneously satisfy the clues below.
   * Round to the nearest ten, the number is 20.
   * The digit in the hundredths position is 5 more than that in the 10^0 position.
   * The digits in the smallest two positions are both even.
   * There are no digits in the 10^{-3} position or smaller.

   \[
   \begin{array}{c}
   20. \quad \times \quad 2 \quad \times \\
   23 \text{ (even)} \quad 8 \\
   21 \text{ (even)} \quad 6 \\
   \end{array}
   \]

2. [8 pts] Perform the division problem 0.07 ÷ 1.4 by hand. Then clearly explain in 1-2 sentences what we do to the divisor's decimal point, and why we always treat it that way.

   \[
   \begin{array}{c}
   \frac{1}{4} \big| 0.070 \\
   \end{array}
   \]

   We move the decimal point in the divisor to create a whole #. That’s to set up for the sharing model of division, in which the divisor represents the number of groups (must be a whole #) we make.

3. [3 pts] Find an irrational number that is between \(1 \frac{34}{99}\) and 1.343343334....

   \[
   1.34343434\ldots
   \]

   \[
   1.3437373737\ldots
   \]

   \[
   1.343343\ldots
   \]
4. [20 pts - \( \pi, 4, \text{ or } 6 \) each] Convert as indicated. If not possible, say so. Show work as needed.

(a) \( \frac{11}{12} \) to a decimal number, rounded to the nearest hundred thousandth

\[
0.91667
\]

(b) 1.2072007 to a fraction

\[
\frac{12072007}{10000000}
\]

(c) 1.207 to a fraction

\[
\begin{align*}
1.207 & \quad \times 10 \\
1195 & \quad \div 990
\end{align*}
\]

(d) 1.20720722207... to a fraction

not possible

(e) Two hundred and ninety-three thousandths to expanded form using exponents.

\[200.093 = 2 \times 10^2 + 9 \times 10^{-2} + 3 \times 10^{-3}\]

5. [10 pts] Belinda is struggling to understand why the decimals that fractions create always have to either terminate or repeat, no other options. Use ideas about remainders to explain how she might make sense of this concept.
6. [10 pts] Use your choice of unit-rate or scaling reasoning to solve the problem below. Show clear work OR explain your thinking, and tell which method you chose.

Diane uses a quarter of a bag of flour for each 2 dozen cookies she bakes. How many cookies can she make with 4 bags of flour?

Unit-rate:
\[
\frac{1}{4} \text{ bag} = 2 \text{ dozen} \\
1 \text{ bag} = 8 \text{ dozen} \quad \text{(unit info)} \\
4 \text{ bags} = 32 \text{ dozen} \quad \text{(final answer)}
\]

Scaling:
4 bags contain 16 quarter-bags, 16 recipes.
So that many bags (4) make 16 recipes worth of cookies: 32 dozen.

7. [10 pts] Jericho, Kineesha, and Lu cleaned the yard last week. Jericho worked 7.5 hours while Kineesha worked 8 hours and Lu worked 5.5 hours. If they were paid $100.80 for the entire job, how much should Lu get as a fair share?

\[
\begin{array}{|c|c|}
\hline
\text{hours} & \$ \\
\hline
J & 7.5 \\
K & 8 \\
L & 5.5 & x \\
\hline
\text{total} & 21 & \$100.80 \\
\hline
\end{array}
\]

\[
\frac{5.5}{21} = \frac{x}{100.80}
\]

\[
21x = 554.4
\]

\[
x = \$26.40
\]
8. [8 pts] One grape-ade recipe calls for 3 parts of grape juice to 5 parts of sparkling water while another calls for 5 parts of juice to 7 parts of water. If you make 24 gallons of each, which recipe needs more grape juice?

<table>
<thead>
<tr>
<th>3/5 Recipe</th>
<th>5/7 Recipe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Grape:</td>
<td>Water</td>
</tr>
<tr>
<td>□ □ □ □ □</td>
<td>□ □ □ □ □</td>
</tr>
<tr>
<td>24 total:</td>
<td>24 total:</td>
</tr>
<tr>
<td>9 grape</td>
<td>10 grape</td>
</tr>
</tbody>
</table>

9. [9 pts - 3 each] Complete each number sentence below to illustrate ONLY the property named.

(a) Commutative Property of Multiplication: \( \left( \frac{1}{2} + \frac{3}{4} \right) + 5 \cdot \left( \frac{6}{7} \cdot \frac{6}{7} \right) = ???

\( \left( \frac{1}{2} + \frac{3}{4} \right) + 5 \cdot \left( \frac{6}{7} \cdot \frac{6}{7} \right) = ???

(b) Associative Property of Addition: \( \left( \frac{1}{2} + \frac{3}{4} \right) + 5 \cdot \left( \frac{6}{7} \cdot \frac{6}{7} \right) = ???

\( \frac{1}{2} + \left( \frac{3}{4} + 5 \cdot \left( \frac{6}{7} \cdot \frac{6}{7} \right) \right) = ???

(c) Identity Property of Multiplication: \( \left( \frac{1}{2} + \frac{3}{4} \right) + 5 \cdot \left( \frac{6}{7} \cdot \frac{6}{7} \right) = ???

\( \left( \frac{1}{2} + \frac{3}{4} \right) + 5 \cdot \left( \frac{6}{7} \cdot \frac{6}{7} \right) = ???

10. [9 pts - 3 each] Write the computation to be performed and the name of the model (i.e., “take-away,” etc.) required for each word problem below.

(a) SRU’s road crews used 16.2 tons of salt this winter. If they used the same amount on each of the 6 heavy snowfalls, how much salt was used per snowfall?

\[ 16.2 \div 6 \]

(b) Perpetua has a QPA of 3.41, but she needs a 3.6 to earn a scholarship. How much must she raise her QPA?

\[ 3.60 - 3.41 \]

(c) Carrie’s Bakery uses 0.52 pounds of sugar per batch of decorator icing. If they make 40 batches, how much sugar will that require?

\[ 0.52 \times 40 \]