1. For each problem set up and solve a proportion. Label ALL numbers!!!

a. A recipe requires 3 cups of flour to make 27 dinner rolls. How much flour is needed to make 9 rolls?

\[
\frac{3e}{24r} = \frac{xe}{9r}
\]

\[X = 1c\]

b. The world-wide sea level has risen 22.75 mm in the past 6.5 years. At this rate, how much higher will the level be 8 years from now?

\[
\frac{22.75mm}{6.5y} = \frac{Xmm}{8y}
\]

\[X = 28mm\]

c. If a woman making $25 an hour gets a 10% raise, how much will she now make?

\[
10% \left( \frac{10}{100} \right) = \frac{x}{25}
\]

\[X = 2.5\]

\[
25 + 2.5 = 27.5
\]

d. You buy a computer that was marked 24% off. You end up paying $800 for the computer and there was no tax. How much was the computer originally?

\[
\frac{800}{76%} = \frac{x}{100%}
\]

\[X = 1052.63\]

e. Doug, Mike and Eli go to Ichiban for dinner. They can't spend more than $58 (because that's all they have). They want to leave a 20% tip and they have to pay 6% sales tax on the food. Figure out the maximum amount they can spend without going over (otherwise they would go to jail).

\[
\frac{58}{126%} = \frac{x}{100%}
\]

\[X = 46.03\]

\[
\text{Check: Total: } 46.03 \times 2(46.03) = 9.206 + 0.6(46.03) = 2.7618
\]

\[46.03 = \text{sum } \neq 58\]
2. Mr. Dutelle takes used drum sets, fixes them up and then marks the price up by 70%. His staff gets a 20% commission on the markup for selling the drum sets. Find the missing values in the table.

<table>
<thead>
<tr>
<th>Buying Price</th>
<th>Markup (70% of buying price)</th>
<th>Selling Price</th>
<th>Commission (20% of markup)</th>
<th>Profit (money the shop makes)</th>
</tr>
</thead>
<tbody>
<tr>
<td>$100</td>
<td>$70</td>
<td>$170</td>
<td>$14</td>
<td>$56</td>
</tr>
<tr>
<td>$120</td>
<td>$84</td>
<td>$204</td>
<td>$16.8</td>
<td>$67.2</td>
</tr>
<tr>
<td>$60</td>
<td>$42</td>
<td>$102</td>
<td>$8.40</td>
<td>$33.6</td>
</tr>
<tr>
<td>$150</td>
<td>$105</td>
<td>$255</td>
<td>$21</td>
<td>$84</td>
</tr>
<tr>
<td>N</td>
<td>.7N</td>
<td>1.7N</td>
<td>.14N</td>
<td>.56 N</td>
</tr>
</tbody>
</table>

70% of N = .7N, 170% of N = 1.7N, 20% of $70 = $14, 1.7 - 1.4 = .56

3. E-Kat must correctly answer at least 80% of the questions on an exam about cats in order to get her cat license. She has already correctly answered 26 questions and incorrectly answered 4 questions. How many of the 15 questions remaining must E-Kat answer in order to get her next license?

A. At least 10
B. At least 11
C. At least 12
D. At least 13

26 + 4 + 15 = 45 questions total
80% of 45 is .8(45) = 36

or \[
\frac{80}{100} = \frac{x}{45} \quad \Rightarrow \quad x = 36
\]

She needs to answer at least \(36 - 26 = 10\) more questions correctly.

Justify your answer to #3 below...

4. Garrett hiked 14 miles in 4 hours. Elena hiked 21 miles in 6 hours. Do these rates demonstrate a proportional relationship? Why or why not?

\[
\begin{align*}
\text{Garrett} & : 14 \text{m} \quad ? \\
\text{Elena} & : 21 \text{m} \quad 6 \text{h}
\end{align*}
\]

Yes, both \(14/4\) and \(21/6 = 3.5\).
5. A bottle of detergent that will wash 32 loads of laundry will cost $4.80. A bottle that will wash 50 loads costs $7.00. Which is the better deal? Prove your answer.

\[
\frac{32 \times \text{loads}}{\$4.80} = \frac{1 \times \text{loads}}{\$x} \quad \text{or} \quad \frac{50 \times \text{loads}}{\$7.00} = \frac{1 \times \text{loads}}{\$x}
\]

\[
x = \$0.15 \quad \text{or} \quad x = \$0.14
\]

It costs $0.15 per load.

6. Look at the figures below.

Do the corresponding sides of the figure form a proportional relationship? Why or why not?

\[
\frac{15 \text{ cm}}{18 \text{ cm}} = \frac{9 \text{ cm}}{12 \text{ cm}}
\]

\[
15/18 = 0.8 \quad 9/12 = 0.75
\]

The ratios of corresponding sides are not equivalent, thus they do not form a proportional relationship.

7. Jeb paid $35 to rent a kayak for \(1\frac{3}{4}\) hours.

a. Write an equation to show the relationship between \(h\), time in hours, and \(d\), cost in dollars.

\[
\frac{\$35}{1.75 \text{ hours}} = \frac{\$x}{1 \text{ hour}} \quad \text{or} \quad D = 20h
\]

\[
x = \$20
\]

b. Graph the equation to the right and label the unit cost for renting a kayak.
8. Roscoe's family has dinner at a restaurant. The total cost is $103.80. This includes 5% tax and 15% tip on the pre-tax amount. How much was the bill before tax and tip?

Show your work.

\[ \frac{\$103.80}{120\%} = \frac{x}{100\%} \]

\[ x = \$86.5 \]

Check: 5% tax = 0.05(86.5) = \$4.325

15% tip = 0.15(86.5) = \$12.975

Answer: \$86.5

86.5 + 4.325 + 12.975 = \$103.8

9. Two construction companies are building 1,100 foot tall skyscrapers. Company A has finished 550 feet of construction in 5 \( \frac{1}{2} \) months. Company B has finished 385 feet of construction in 3 \( \frac{1}{2} \) months. If both companies continue to build at the same rate, which company will reach the top first?

Answer: company B

Justify your answer.

\[ \frac{550ft}{6.5m} = \frac{1100ft}{x_m} \]

\[ x = 11 \text{ months} \]

\[ \frac{385ft}{3.5m} = \frac{1100ft}{x_m} \]

\[ x = 10 \text{ months} \]

10. In cooking school, 4 students made secret sauce. One of the students made a mistake in the recipe. Who was it?

Answer: Moncef

Justify your answer.

<table>
<thead>
<tr>
<th>Student</th>
<th>Mayonnaise</th>
<th>Mustard</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hal</td>
<td>4 ounces</td>
<td>2.5 ounces</td>
</tr>
<tr>
<td>Moncef</td>
<td>7.5 ounces</td>
<td>5 ounces</td>
</tr>
<tr>
<td>Sheena</td>
<td>2( \frac{2}{5} ) ounces</td>
<td>1( \frac{1}{2} ) ounces</td>
</tr>
<tr>
<td>Claire</td>
<td>12 ounces</td>
<td>7.5 ounces</td>
</tr>
</tbody>
</table>

Moncef's ratio of Mayonnaise to Mustard is not equivalent to the other students' ratios.