PROPORTION - PERCENTAGE - FRACTIONS

Name: …………………………………………………………………………………………………………………………………

1) Calculate and simplify: (3 points)
   a) \[ \frac{2}{5} \left( \frac{1}{2} + \frac{3}{5} \right) \times 2 = \]
   b) \[ \frac{3}{5} \div \frac{6}{15} \div \frac{4}{5} \div \frac{1}{3} = \]
   c) \[ \left( \frac{1}{7} + \frac{1}{3} \right) \times \left( \frac{1}{2} - \frac{3}{7} \right) = \]

2) Write each ratio as a fraction, a decimal and a percent: (1 point)

<table>
<thead>
<tr>
<th>RATIO</th>
<th>FRACTION</th>
<th>DECIMAL</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 to 100</td>
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<tr>
<td>9 to 50</td>
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<td>6 to 100</td>
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<tr>
<td>72 to 100</td>
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</tbody>
</table>

3) Find the value of X: (1 point)
   a) 30% of X = 36
   b) 150% of X = 114
   c) 74% of X = 111
   d) 22% of X = 77

4) There are 750 students at Murillo School. 135 students ride the bus to school. What percentage of the students do not ride the bus? (1 point)

5) The price of a cinema ticket increases from 6 euros to 7.5 euros. What is the percentage of increase? (1 point)

6) If a farmer has enough cattle feed to feed 240 cows for 15 days. How long would the same food last for 360 cows? (1 point)

7) Rafael Nadal won 86% of his matches last year. If he won 80 matches in 2008, how many matches did he play? (1 point)

8) Walter got a 15% discount when he bought his new jacket. If the original price, before the discount, was €70, how much was the discount? (1 point)
SOLUTIONS

1) a) \[\frac{2}{5} \times \left(\frac{1}{2} \times \frac{3}{5}\right) \times 2 = \frac{2}{5} \times \frac{3}{10} = \frac{6}{50} = \frac{3}{25}\]

b) \[\frac{3}{5} + \frac{6}{15} = \frac{3 \times 5}{5 \times 5} + \frac{6 \times 3}{5 \times 3} = \frac{15}{25} + \frac{18}{25} = \frac{33}{25}\]

c) \[\left(\frac{1}{7} + \frac{1}{3}\right) \times \left(\frac{1}{2} - \frac{3}{7}\right) = \frac{8}{21} \times \frac{12}{14} = \frac{96}{294} = \frac{48}{147}\]

2) Write each ratio as a fraction, a decimal and a percent:

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<th>DECIMAL</th>
<th>PERCENT</th>
</tr>
</thead>
<tbody>
<tr>
<td>15 to 100</td>
<td>\frac{15}{100} = \frac{3}{20}</td>
<td>0.15</td>
<td>15%</td>
</tr>
<tr>
<td>9 to 50</td>
<td>\frac{9}{50}</td>
<td>0.18</td>
<td>18%</td>
</tr>
<tr>
<td>6 to 100</td>
<td>\frac{6}{100} = \frac{3}{50}</td>
<td>0.06</td>
<td>6%</td>
</tr>
<tr>
<td>72 to 100</td>
<td>\frac{72}{100} = \frac{18}{25}</td>
<td>0.72</td>
<td>72%</td>
</tr>
</tbody>
</table>

3) Find the value of X:

a) \[30\% \text{ of } X = 36 \]
\[
\frac{30}{100} = \frac{36}{x} \rightarrow 30x = 3600 \rightarrow x = 120
\]

b) \[150\% \text{ of } X = 114 \]
\[
\frac{150}{100} = \frac{114}{x} \rightarrow 150x = 11400 \rightarrow x = 76
\]

c) \[74\% \text{ of } X = 111 \]
\[
\frac{74}{100} = \frac{111}{x} \rightarrow 74x = 11100 \rightarrow x = 150
\]

d) \[22\% \text{ of } X = 77 \]
\[
\frac{22}{100} = \frac{77}{x} \rightarrow 22x = 7700 \rightarrow x = 350
\]

4) There are 750 students at Murillo School. 135 students ride the bus to school. What percentage of the students do not ride the bus? \[\frac{750 - 135}{750} = \frac{615}{750} = \frac{615}{100} \times x = 61.5 \% \]

SOLUTION: 82% of the students do not ride the bus

5) The price of a cinema ticket increases from 6 euros to 7.5 euros. What is the percentage of increase? \[\frac{7.5 - 6}{6} = \frac{1.5}{6} \times 100 = 25\% \]

SOLUTION: the percentage increases is 25%
6) If a farmer has enough cattle feed to feed 240 cows for 15 days. How long would the same food last for 360 cows?

240 cows --------------- 15 days INVERSE proportion
360 cows --------------- x days

\[
\frac{240}{360} = \frac{x}{15} \rightarrow 360x = 240 \times 15 \rightarrow 360x = 3600
\]

\[
x = \frac{3600}{360} = 10
\]

SOLUTION: The same food would last 10 days to feed 360 cows

7) Rafael Nadal won 86% of his matches last year. If he won 80 matches in 2008, how many matches did he play?

86% -------------- 80 matches

\[
\frac{86}{100} = \frac{80}{x} \rightarrow 86x = 8000 \rightarrow x = 93.02
\]

SOLUTION: Rafael Nadal played 93 matches in 2008

8) Walter got a 15% discount when he bought his new jacket. If the original price, before the discount, was €70, how much was the discount?

\[
15\% \text{ of } 70 = \frac{15 \times 70}{100} = 10.5
\]

SOLUTION: The discount was €10.5