

**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)  $\frac{3}{5} \div \frac{6}{15} - \frac{4}{5} \div \frac{1}{3} =$       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)

RATIO	FRACTION	DECIMAL	PERCENT
15 to 100			
9 to 50			
6 to 100			
72 to 100			

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

$$1) a) \frac{2}{5} - \left( \frac{1}{2} + \frac{3}{5} \right) \times 2 = \frac{2}{5} - \frac{5+6}{10} \times 2 = \frac{2}{5} - \frac{22}{10} = \frac{2}{5} - \frac{11}{5} = -\frac{9}{5}$$

$$b) \frac{3}{5} \div \frac{6}{15} - \frac{4}{5} \div \frac{1}{3} = \frac{3 \times 15}{5 \times 6} - \frac{4 \times 3}{5} = \frac{3}{2} - \frac{12}{5} = \frac{15}{10} - \frac{24}{10} = -\frac{9}{10}$$

$$c) \left( \frac{1}{7} + \frac{1}{3} \right) \times \left( \frac{1}{2} - \frac{3}{7} \right) = \frac{3+7}{21} \times \frac{7-6}{14} = \frac{10}{21} \times \frac{1}{14} = \frac{5}{147}$$

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

RATIO	FRACTION	DECIMAL	PERCENT
15 to 100	$\frac{15}{100} = \frac{3}{20}$	0.15	15%
9 to 50	$\frac{9}{50}$	0.18	18%
6 to 100	$\frac{6}{100} = \frac{3}{50}$	0.06	6%
72 to 100	$\frac{72}{100} = \frac{18}{25}$	0.72	72%

3) Find the value of X:

a) 30% of X = 36 $\frac{30}{100} = \frac{36}{x} \rightarrow 30x = 3600 \rightarrow x = 120$	b) 150% of X = 114 $\frac{150}{100} = \frac{114}{x} \rightarrow 150x = 11400 \rightarrow x = 76$
c) 74% of X = 111 $\frac{74}{100} = \frac{111}{x} \rightarrow 74x = 11100 \rightarrow x = 150$	d) 22% 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?  $750 - 135 = 615$ 

$$750 \text{ ----- } 615 \quad \text{DIRECT proportion } \frac{750}{100} = \frac{615}{x} \rightarrow 750x = 61500 \rightarrow x = 82$$

$$100 \text{ ----- } x$$

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?

$$7.5 - 6 = 1.5 \quad 6 \text{ ----- } 1.5 \quad \frac{6}{100} = \frac{1.5}{x} \rightarrow 6x = 150 \rightarrow x = 25\%$$

$$100 \text{ ----- } x$$

SOLUTION: the percentage increases is 25%

6) If a farmer has enough cattle feed to feed 240 cows for 15 days.

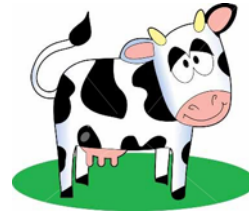
How long would the same food last for 360 cows ?

240 cows ----- 15 days    INVERSE proportion

360 cows ----- x days

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

$$x = 3600 \div 360 = 10$$



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?

$$86\% \text{ ----- } 80 \text{ matches} \quad \frac{86}{100} = \frac{80}{x} \rightarrow 86x = 8000 \rightarrow x = 93.02$$

100% ----- x matches

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