

## Ratios & Proportions

Ratio	Proportion	
Last year, the ratio of the number of tennis matches that Central College's women's team won to the number of matches they lost was 7:3.	What percent of their matches did the team win?  $\frac{7}{3+7} = \frac{7}{10} \text{ or } 0.70 \text{ or } 70\%$	
<b>Ratio Example</b>		
If 45% of the students at a college are male, what is the ratio of male students to female students?  Assume 100 students (a good number to use when using percent)  Then 45 of them are male, and 100-45 = 55 are female. The ratio of males to females is $\frac{45}{55} = \frac{9}{11} \text{ or } 0.82 \text{ or } 82\%$		
<b>Proportion Example</b>		
If the ratio of small to medium to large pizzas sold at Vinny's was 8:17:15, what proportion of the bags sold were medium?  $\frac{17}{8 + 17 + 15} = \frac{17}{40} \text{ or } 0.425 \text{ or } 42.5\%$		
Solving Proportions:	Example 1	Example 2
Solve proportions by cross-multiplying: if $\frac{a}{b} = \frac{c}{d}, \text{ then } ad = bc$	If $\frac{3}{7} = \frac{x}{84}$ , what is the value of x?  $3(84) = 7x \rightarrow 252 = 7x$ $x = 36$	If $\frac{x+2}{17} = \frac{x}{16}$ , what is the value of x?  $16(x+2) = 17x \rightarrow 16x + 32 = 17x$ $x = 32$
Example 3	Example 4	Example 5
If Rama types at the rate of 35 words per minute, how long will it take her to type 987 words?  $\frac{\text{wordstyped}}{\text{minutes}} = \frac{35}{1} = \frac{987}{x}$  $35x = 987 \rightarrow x = \frac{987}{35}$  $= 28.2 \text{ minutes}$	If David types at the rate of 35 words per minute, how many words can he type in 85 minutes?  $\frac{\text{wordstyped}}{\text{minutes}} = \frac{35}{1} = \frac{x}{85}$  $x = 35 \times 85$ $= 2975 \text{ words}$	If 3 cookies cost 50¢, how many cookies can you buy for \$20?  We need to get similar units (change cents into dollars; 50¢ = \$0.50)  $\frac{3}{.5} = \frac{x}{20} \Rightarrow .5x = 60$  $x = 120 \text{ cookies}$