

Ratio and Proportion

Ratio

Proportion

Ratio

A ratio compares two quantities of the same kind.

Example

In my class there are 8 girls and 12 boys. The ratio of girls to boys is 8 : 12. This ratio simplifies to 2 : 3

Before simplifying a ratio, each quantity should be in the same units.

e.g. \$5 to \$3

e.g. 60 minutes to 30 minutes

A ratio can be expressed in several forms.

e.g. A ratio of 1 to 2 can be written 1 : 2 or $\frac{1}{2}$ or 50%

Ratios can be simplified like fractions.

e.g. 20 : 40 = 10 : 20

10 : 20 = 5 : 10

5 : 10 = 1 : 2

Examples	Answers
1. Write the ratio 15 : 20 as:	
(a) A fraction	(a) $\frac{15}{20} = \frac{3}{4}$
(b) A percentage	(b) $\frac{15}{20} = \frac{75}{100} = 75\%$
2. Two people divide \$80 in the ratio 3 : 7	2. The ratio 3 : 7 means a total of 10 parts. Each part is $\$80 \div 10 = \8
How much does each person get?	The first person gets: $3 \times \$8 = \24 The second person gets: $7 \times \$8 = \56



Proportion

Two sets of numbers are in direct proportion when the ratio between corresponding members of the sets is the same.

e.g. $A = \{3, 6, 9\}$ is in proportion to $B = \{12, 24, 36\}$ because members of set B are 4 times the size of the corresponding members of set A.

Problems involving proportion can be solved in two ways:

Method 1. Find the value of one of the units being used.

Method 2. Form an equation involving corresponding ratios.

Example 1 Method 1	Method 2
A driver uses 10 litres of petrol to cover 80 km. How much petrol would be used to cover 200 km?	A driver uses 10 litres of petrol to cover 80 km. How much petrol would be used to cover 200 km?
80 km requires 10 litres. 1 km would require $\frac{10}{80}$ litres. 200 km would require $\frac{10}{80} \times 200$ litres. 25 litres would be required.	Let x be the amount of petrol needed. $\frac{x}{10} = \frac{200}{80}$ $x = \frac{200 \times 10}{80}$ $x = 25$ litres 25 litres would be required.

Ratio and Proportion

Unit Test #9

Select your answers to the following 10 questions from the pop-up menus in the right hand column. When you are satisfied with your answers, fill in your name in the space provided below the test, and click the "Submit Test" button. Clicking the "Begin Test Again" button will clear all the answers.

Q1:	\$360 is divided among 3 friends in the ratio 3 : 4 : 5. The biggest share is:	A. \$90 B. \$120 C. \$150 D. \$180	Answer 1:	<input type="checkbox"/>
Q2:	Mr Eru and Mr Ridge share a prize of \$20 000 in the ratio 2 : 3. How much does Mr Eru get?	A. \$4 000 B. \$8 000 C. \$12 000 D. \$13 333.33	Answer 2:	<input type="checkbox"/>
Q3:	The ratio 15 : 25 written in its simplest form is	A. $\frac{15}{25}$ B. $\frac{1.5}{2.5}$ C. $\frac{3}{5}$ D. $\frac{60}{100}$	Answer 3:	<input type="checkbox"/>
Q4:	In a competition Dave wins \$50 and Anna wins \$100. What is the ratio of Dave's winnings to Anna's winnings?	A. 1 : 3 B. 1 : 2 C. 2 : 1 D. 3 : 1	Answer 4:	<input type="checkbox"/>
Q5:	Troy, Justin and Hayden share a sum of \$300. Troy receives \$150, Justin receives \$100. What fraction of the \$300 does Hayden receive?	A. $\frac{1}{3}$ B. $\frac{1}{4}$ C. $\frac{1}{5}$ D. $\frac{1}{6}$	Answer 5:	<input type="checkbox"/>
Q6:	What is the ratio of the perimeter of a rectangle to its length if the rectangle is 8 cm long and 6 cm wide.	A. 6 : 8 B. 3 : 4 C. 28 : 48 D. 7 : 2	Answer 6:	<input type="checkbox"/>
Q7:	Solve the equation $\frac{x}{5} = \frac{3}{10}$	A. $x = 15$ B. $x = 1.5$ C. $x = 6$ D. $x = \frac{2}{3}$	Answer 7:	<input type="checkbox"/>
Q8:	Which of the following sets is the set {3, 4, 6} in direct proportion to?	A. {6, 8, 10} B. {6, 8, 12} C. {9, 12, 15} D. {9, 16, 24}	Answer 8:	<input type="checkbox"/>

		D. {9, 10, 24}		
Q9:	A driver uses 20 litres of petrol to cover 160 km. How much petrol would he use to cover 400 km?	A. 50 litres B. 25 litres C. 45 litres D. 80 litres	Answer 9:	<input type="checkbox"/>
Q10:	10 pieces of pizza are split in the ratio of 2 : 3 by two hungry girls. How many pieces does the hungriest (or luckiest!) girl get?	A. 8 B. 10 C. 5 D. 6	Answer 10:	<input type="checkbox"/>

Enter your initial
and surname here:

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ANSWERS

(1) c (2) B (3) c (4) B (5) D (6) D (7) B (8) B (9) A (10) D

Ratio and Proportion

1. Write these ratios as fractions in their simplest form:

- (a) 3 : 10
- (b) 12 : 20
- (c) 9 : 4
- (d) 2 : 1

2. Write these percentages as ratios in their simplest form:

- (a) 20%
- (b) 85%
- (c) 150%
- (d) 100%

3. Express the following ratios as simply as possible:

- (a) 6 cm : 12 cm
- (b) 14 : 21
- (c) \$30 : \$40
- (d) 5 kg : 20 kg : 25 kg

4. Make the units of the following ratios the same and then simplify:

- (a) 200 g : 1 kg
- (b) \$3 : 50c
- (c) 100 m : 1 km
- (d) 20 minutes : 2 hours

5. (a) If $3 : 5 = x : 20$, find the value of x .

(b) If $d : 5 = 9 : 15$, find the value of d .

(c) If $\frac{5}{x} = \frac{15}{9}$, find x .

(d) Find x if $\frac{2x}{8} = \frac{9}{16}$

6. (a) Divide 63 into two parts in the ratio 2 : 5

(b) Two people share \$85 in the ratio 4 : 1.

How much does each person receive?

(c) A piece of wood, of length 72 cm, is cut into three smaller pieces in the ratio 1 : 2 : 3.
How long is each piece?



10/10

Excellent work!

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