

Ratios and Proportions

Name: _____

1

A restaurant cook prepares his recipe for spaghetti sauce. He usually adds 15 mL of salt for flavour. The following week, he decides to adjust his original recipe to make it less salty. Which adjustments should the cook make to ensure that his sauce is less salty?

- A) Add a can of tomato juice.
- B) Reduce the amount of tomato juice by one can.
- C) Double the recipe.
- D) Prepare half the recipe.

2

To make concrete, one needs 3 parts cement, 5 parts sand and 8 parts stone. If Jack put 15 shovel-fulls of cement into the mixer, how many shovel-fulls of sand will he have to add?

- A) 15 shovels
- B) 24 shovels
- C) 25 shovels
- D) 40 shovels

3

A photograph is 12 cm long and 5 cm wide. After being enlarged, its length is 15 cm. Which expression can be used to calculate the width of the enlarged photograph?

A) $\frac{5 \times 12}{15}$

C) $\frac{12}{5 \times 15}$

B) $\frac{12 \times 15}{5}$

D) $\frac{5 \times 15}{12}$

4

What is the ratio $\frac{16}{24}$ equivalent to?

A) $\frac{16+8}{24-8}$

C) $\frac{16 \div 8}{24 \div 8}$

B) $\frac{16+8}{24+8}$

D) $\frac{16 \times 8}{24 \div 8}$

5

Which pair of ratios does NOT form a proportion?

A) $\frac{2}{3}$ and $\frac{34}{51}$

C) $\frac{7.2}{12}$ and $\frac{12}{7.2}$

B) $\frac{9}{12}$ and $\frac{12}{16}$

D) $\frac{0.3}{12}$ and $\frac{7.5}{300}$

6

Having recently thrown a party for your friends, you now know that you need 6 bags of chips for 8 people. Your sister is planning a party for 12 people and hopes your experience will help her determine how many bags of chips she will need.

Which of the following proportions will help her find out how many bags of chips she is going to need?

A) $\frac{6}{8} = \frac{x}{12}$

C) $\frac{8}{6} = \frac{x}{12}$

B) $\frac{6}{8} = \frac{12}{x}$

D) $\frac{8}{12} = \frac{x}{6}$

7

A store shelf, which displays small, medium and large sweaters, is 832 cm long. It is divided into three sections in proportion to the numbers 3, 20 and 9 respectively.

What is the length of each section in centimetres?

- A) 26, 574 and 232
- B) 78, 520 and 234
- C) 78, 524 and 230
- D) 83, 173 and 78

8

A cyclist travelled 775 km in 68 hours. At this speed, how many kilometres did he cover in 16 hours?

Which proportion can be used to solve the problem?

A) $\frac{68}{775} = \frac{x}{16}$

C) $\frac{775}{68} = \frac{16}{x}$

B) $\frac{775}{68} = \frac{x}{16}$

D) $\frac{775}{16} = \frac{68}{x}$

9

Which series of ratios is equivalent to $\frac{5}{12}$?

A) $\frac{5}{24}, \frac{10}{36}, \frac{15}{48}, \frac{20}{60}, \frac{25}{20}$

B) $\frac{10}{24}, \frac{15}{36}, \frac{20}{48}, \frac{25}{60}, \frac{50}{120}$

C) $\frac{10}{24}, \frac{15}{36}, \frac{25}{48}, \frac{35}{72}, \frac{40}{96}$

D) $\frac{25}{48}, \frac{45}{108}, \frac{50}{120}, \frac{65}{144}, \frac{100}{240}$

10

In the following proportion, what is the value of the missing term?

$$\frac{50}{15} = \frac{150}{?}$$

- A) 500
 B) 112.5
 C) 45
 D) 5

11

For the end-of-year class party, Nadia offered to make her favorite punch for all her classmates.

To prepare the punch, she needs both orange juice and grapefruit juice in the following proportions:

$$\frac{900 \text{ mL orange juice}}{300 \text{ mL grapefruit juice}}$$

This quantity is enough for 10 people. She wants to make this recipe for the 30 students in her class.

Which ratio can be used to calculate the quantity of orange juice and grapefruit juice needed?

- A) $\frac{900 \div 3}{300 \div 3}$
 B) $\frac{900 + 30}{300 + 30}$
 C) $\frac{900 \times 3}{300 \times 3}$
 D) $\frac{900 \times 30}{300 \times 30}$

12

The corresponding sides of two squares are in the ratio of 2 : 3.

Which of the following pairs could be measurements of the sides of these squares?

1. 4.6 and 6.4
2. 15 and 22.5
3. 20 and 30.6
4. 84.4 and 126.6

- A) 1 and 2
 B) 1 and 3
 C) 2 and 4
 D) 3 and 4

Short Answer Ratios and Proportions

Name: _____

1 Canadian athletes won 13 medals at the 1994 winter Olympics in Lillehammer.

The types of medals won are listed in the table below.

Canada's Medals at Lillehammer

Gold	Silver	Bronze	Total
3	6	4	13

Quebec athletes won 9 of these medals. Myriam Bédard won two gold medals and a silver medal.

Express as a ratio the number of medals won by Myriam Bédard to the total number of medals won by Canadian athletes.

2 Mark scored 32 out of 40 on a Mathematics test.

If he wants to maintain this average, what mark does he have to get out of 75 on his next math test?

3 A photograph is 10 cm long and 7 cm wide. After being enlarged, it is 15 cm long.

What is the width of the enlarged photo?

4 Simone takes her pulse and finds that her heart beats 18 times in 15 seconds.

At this rate, how many times does her heart beat in one minute (60 seconds)?

5 A cook, Henri, is making salad dressing for a large wedding party.

He uses a 1 : 4 ratio of vinegar to oil.

Henri pours 2 cups of vinegar and 8 cups of oil into a large bowl.

Henri's assistant, Jessica, knows that more salad dressing is needed. Jessica pours 3 cups of vinegar into the large bowl.

Exactly how much oil must Jessica pour into the mixture to keep the ratio of vinegar to oil at 1 : 4?

6 In September, Ann signed up for a mixed soccer league. By the end of the season, the ratio of boys/girls had diminished, yet the number of boys had remained the same.

What change in the team membership could explain this situation?

Ratios & Proportions - Extended Questions

Name : _____

1

Every spring, geese head north for several months. If there are on average 3 blue geese in a population of 500, how many blue geese should there be in a population of 10 000?

2

Frank, Annie and Catherine won the three cash prizes in a raffle.

The ratio of Frank's winnings to Annie's winnings is 4 : 5.

The ratio of Frank's winnings to Catherine's winnings is 4 : 2.

Annie won \$3000.

What was the total amount of money won during this raffle?

3

Anita, Bruno and Carol have invested their savings in a window-washing company.

- The amounts invested by Anita and Bruno are in a ratio of 5 : 2.

- The amounts invested by Anita and Carol are in a ratio of 4 : 3.

Given that Carol invested \$600, what is the *total amount* invested by these three persons?

4

Rafik, Robert, and Jason are playing Scrabble. After each had finished his first turn, they compared their scores.

Rafik's and Robert's scores were in a ratio of 4 : 3

Rafik's and Jason's scores were in a ratio of 8 : 5.

Robert got 36 points in his first turn.

How many points did the three players score in total after each one had finished his first turn?

5

Sara, Terry and Mark used all the money in the student council budget to buy various items for a school raffle.

Sara spent 4 times as much money as Terry did.

The ratio of Sara's spending to Mark's spending was 2 : 5.

Terry spent \$85.

How much money was in the student council budget?

6

The perimeter of a rectangle is 200 m. Find the dimension of this rectangle given that they are in the ratio of 2 to 3.

ANSWERS MULTIPLE CHOICE

- 1) A 2) C 3) D 4) C 5) C 6) A
7) B 8) B 9) B 10) C 11) D 12) C

Answer Key (Short Answer)

1

The ratio is $\frac{3}{13}$ or 3:13.

2

He will have to get a mark of 60 out of 75.

3

10.5 cm wide.

4

72 beats

5

Examples of appropriate solutions

Example 1

Ratio of vinegar to oil is 1 : 4

2 + 3 = 5 cups of vinegar in the bowl

$$\frac{1}{4} = \frac{5}{x}$$

x = 20 cups of oil required

20 – 8 = **12 cups** of oil to be added

Answer: Jessica must pour **12** cups of oil into the mixture.

Example 2

Ratio of vinegar to oil is 1 : 4

$$\frac{1}{4} = \frac{3}{x}$$

$$x = 12$$

6

The change in the team's membership that could explain this situation is:

the number of girls increased.

Answers to Extended Questions

1

Result 60 blue geese

2

Answer The total amount of money won during this raffle was \$6600.

3

$$600 + 800 + 320 = 1720$$

Answer The total amount invested by these three people is \$1720.

4

Total number of points

$$36 + 48 + 30 = 114$$

Answer In total, the three players scored 114 points after each had his first turn.

5

Answer: There was \$1275 in the student council budget.

6

Result The dimensions are 40 m by 60 m.