

## Rates 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)  $\frac{775}{16} = \frac{68}{x}$

12

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

13

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

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

A) 500

C) 45

B) 112.5

D) 5

14

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)  $\frac{900 \div 3}{300 \div 3}$

C)  $\frac{900 \times 3}{300 \times 3}$

B)  $\frac{900 + 30}{300 + 30}$

D)  $\frac{900 \times 30}{300 \times 30}$

15

Marie works in a souvenir shop. At the end of the week, she is paid \$300.00. Her pay includes a base salary of \$220.00, plus a commission for the sale of 20 T-shirts.

How much commission does she receive for the sale of each T-shirt?

- A) \$4.00/T-shirt
- B) \$11.00/T-shirt
- C) \$15.00/T-shirt
- D) \$26.00/T-shirt

16

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

17

After completing a 100-metre race, four students measured their heart rates and recorded the following results :

Adam : 25 beats / 15 seconds

Robert :55 beats / 30 seconds

Luca : 75 beats / 45 seconds

Ryan : 80 beats / 50 seconds

Which of the four students had the most rapid heart rate?

- A) Adam
- B) Robert
- C) Luca
- D) Ryan

18

A box of oatmeal offers an assortment of four different flavours.

The chart below gives the nutritional value of these four flavours of oatmeal.

	Quantity of oatmeal per packet (in g)	Number of calories per packet
Apple and cinnamon	36	137
Maple and brown sugar	48	177
Mixed fruit	45	180
Raisin	50	197

Which flavour contains the fewest calories per gram?

- A) Apple and cinnamon                      C) Mixed fruit  
B) Maple and brown sugar                  D) Raisin

19

Leah is the maintenance supervisor of four private pools. For safety's sake, a pool should contain:

1 L of chlorine for every 11 000 L of water.

Leah measured the concentration of chlorine in all four pools this morning.

Pool 1: 2 L of chlorine in 24 000 L of water

Pool 2 : 2.5 L of chlorine in 22 500 L of water

Pool 3 : 1.5 L of chlorine in 16 500 L of water

Pool 4 : 2 L of chlorine in 21 000 L of water

Into which pool should Leah add chlorine in order to keep it at a safe level?

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

20

In Computer Science class, students determine how fast they can accurately type. Jordan is able to type 35 words in 60 seconds

Of the following, which student can type faster than Jordan can?

- A) Sami types 32 words in 60 seconds.
- B) Rachel types 35 words in 80 seconds.
- C) Marty types 37 words in 55 seconds.
- D) Liam types 70 words in 120 seconds.

21

Who is drinking the sweetest coffee?

- A) Tabitha put 2 cubes of sugar into 300 mL of coffee.
- B) Ariane put 5 cubes of sugar into 700 mL of coffee.
- C) Allan put 2 cubes of sugar into 400 mL of coffee.
- D) Nick put 4 cubes of sugar into 500 mL of coffee.

ANSWERS MULTIPLE CHOICE

1 A

2 C

3 D

4 C

5 C

6 A

7 B

8 B

9 B

13 C

14 C

15 A

16 C



17

B

18

B

19

A

20

C

21

D