

TEST SOLUTIONS



Year 8 Level
Department of Mathematics 2015
Parade College

Name: _____

Tutor Group: _____

Ch 5: Ratios Test

Section	No. of questions	Marks
A: Vocabulary knowledge	5	5
B: Multiple Choice	10	10
C: Short Answer	7	30
D: Analysis Problem	2	5

Your marks

/50 %

Instructions

- Read questions carefully
- Calculators may be used.
- No sharing of equipment.
- Use a pencil when completing questions

Section A: Vocabulary Knowledge

(6 marks)

Complete the sentence by choosing the appropriate word from the word list below.

- 1 To compare ratios, one method is to convert them to fractions with the lowest common denominator
- 2 Ratios must always be calculated using the same units.
- 3 A proportion statement can be solved by cross multiplication.
- 4 In order to simplify a ratio we must divide through by the highest common factor
- 5 When two ratios are equal, then the ratios are said to be equivalent.

WORD LIST

Divide

Lowest common denominator

Proportion

Equation

Highest common factor

Units

Equivalent

Multiply

Section B: Multiple Choice

- 10 questions worth 1 mark each
- Working out is not necessary
- Write answers in the appropriate box below.

Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
E	B	A	E	D	C	E	B	A	D

Question 1

The simplified ratio of 8 cm: 16 mm is

- A. 1:2
- B. 2:5
- C. 4:1
- D. 4:5
- E. 5:1

$$\begin{aligned} 80 : 16 \\ = 5 : 1 \end{aligned}$$

Question 2

Mick bought eight watermelons, eleven mangos and 6 nectarines. What is the ratio of nectarines to watermelons?

- A. 6:25
- B. 3:4
- C. 6:11
- D. 8:6
- E. 6:19

$$\begin{aligned} 6 : 8 \\ = 3 : 4 \end{aligned}$$

Question 3

What is the simplest form of the ratio 8 mm : 1 cm ?

- A. 4 : 5
- B. 0.8:0.10
- C. 10: 8
- D. 80:100
- E. 8: 10

$$\begin{aligned} 8 : 10 \\ = 4 : 5 \end{aligned}$$

Question 4

A classroom has 15 girls and 11 boys.

The ratio of boys to the total number of students in the class is:

- A. 11:15
- B. 26:11
- C. 15:26
- D. 15:11
- E. 11:26

$$11 : 26$$

Question 5

16:40 as a fraction in its simplest possible is:

- A $\frac{40}{16}$
- B $\frac{16}{40}$
- C $\frac{1}{2.5}$
- D $\frac{2}{5}$
- E $\frac{5}{2}$

$$\frac{16}{40} = \frac{2}{5}$$

Question 6

8:12 is equivalent to $x : 84$. What is the value of x ?

- A 80
- B 64
- C 56
- D 24
- E 20

$$\begin{array}{c} \times 7 \left(\begin{array}{c} 8 : 12 \\ \downarrow \quad \downarrow \\ x : 84 \end{array} \right) \times 7 \\ x = 56 \end{array}$$

Question 7

Find the value of a given that $40 : 8 = a : 6$

- A $a = 48$
- B $a = 42$
- C $a = 38$
- D $a = 32$
- E $a = 30$

$$\begin{array}{l} \frac{40}{8} = \frac{a}{6} \quad \rightarrow \quad 8a = 240 \\ \therefore 6 \times 40 = 8a \quad \rightarrow \quad a = 30 \end{array}$$

Question 8

It took 20 minutes for Jim to run 7.2 km. On average, how many kilometres does Jim run each minute?

- A 7.2 km/min
- B 0.36 km/min
- C 0.72 km/min
- D 0.036 km/min
- E 3.6 km/min

$$\begin{array}{l} \frac{7.2 \text{ km}}{20 \text{ min}} = 7.2 \div 20 \text{ km/min} \\ = 0.36 \text{ km/min} \end{array}$$

Question 9

Rice costs \$1.80 per kilogram. If Robyn buys 6.5 kg, how much will it cost her?

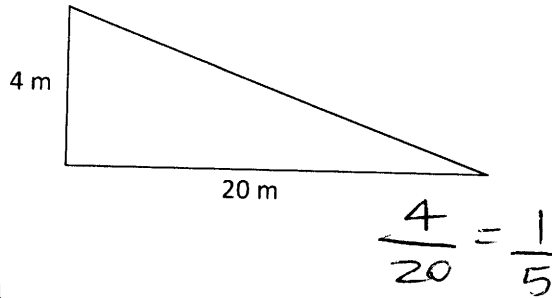
- A \$11.70
- B \$10.80
- C \$9.60
- D \$12.20
- E \$13.00

$$1.80 \times 6.5 = \$11.70$$

Question 10

There is a hill that is 4 metres tall and 20 metres horizontally across (see diagram below). Find the gradient of this hill. Remember to simplify your answer if possible.

- A $\frac{20}{4}$
 B $\frac{5}{1}$
 C $\frac{4}{20}$
 (D) $\frac{1}{5}$
 E $\frac{20}{1}$

**Section C: Short Answer Section**

- Working out must be shown to gain full marks.
- Remember to simplify where possible.

Question 1**(8 marks)**

Write the following ratios into their simplest form.

a) 15:25

$$\begin{array}{l} \div 5 \downarrow 15:25 \downarrow \div 5 \\ 3:5 \end{array} \quad \boxed{3:5}$$

b) 18:33

$$\begin{array}{l} \div 3 \downarrow 18:33 \downarrow \div 3 \\ 6:11 \end{array} \quad \boxed{6:11}$$

c) 450 m : 2 km

$$\begin{array}{l} \div 50 \downarrow 450:2000 \downarrow \div 50 \\ 9:40 \end{array} \quad \boxed{9:40}$$

d) 7 min : 35 sec

$$\begin{array}{l} \div 7 \downarrow 420:35 \downarrow \div 7 \\ 60:5 \\ \div 5 \downarrow 12:1 \downarrow \div 5 \end{array} \quad \boxed{12:1}$$

e) 5.12 : 8

$$\begin{array}{l} 5.12:8 \\ = 512:800 \\ \div 4 \downarrow 128:200 \downarrow \div 4 \\ \div 4 \downarrow 32:50 \downarrow \div 4 \\ \div 2 \downarrow 16:25 \downarrow \div 2 \end{array} \quad \boxed{16:25}$$

Question 2

Work out if the following pair of ratios is in proportion.

(2 marks)

18:72 and 2:8

$$\frac{18}{72} \stackrel{?}{=} \frac{2}{8}$$

$$18 \times 8 = 144$$

$$72 \times 2 = 144$$

∴ Yes they are
in proportion

(8 marks)**Question 3**

Find the value of each unknown

a. $n : 15 = 4 : 5$

$$\frac{n}{15} = \frac{4}{5}$$

$$5n = 4 \times 15$$

$$5n = 60$$

$$\rightarrow \div 5$$

$$n = 12$$

b. $\frac{48}{k} = \frac{4}{3}$

$$3 \times 48 = 4k$$

$$4k = 144$$

$$\rightarrow \div 4$$

$$k = 36$$

c. $\frac{g}{72} = \frac{7}{9}$

$$\frac{g}{72} = \frac{7 \times 8}{9 \times 8}$$

$$\frac{g}{72} = \frac{56}{72} \quad \therefore g = 56$$

d. $x : 8 = 5 : 3$

$$\frac{x}{8} = \frac{5}{3}$$

$$3x = 40$$

$$x = \frac{40}{3} = 13\frac{1}{3}$$

Question 4

The ratio of boys to girls in a class is 4:7.

(2 marks)

a) If there are 12 boys, how many girls are there?

$$\begin{array}{l} \text{boys} \quad \text{girls} \\ 4 : 7 \\ \times 3 \quad \downarrow \quad \downarrow \quad \times 3 \\ 12 : 21 \end{array}$$

∴ 21 girls

b) If there are 14 girls, how many boys are there?

$$\begin{array}{l} \text{boys} \quad \text{girls} \\ 4 : 7 \\ \times 2 \quad \downarrow \quad \downarrow \quad \times 2 \\ 8 : 14 \end{array}$$

8 boys

Question 5**(4 marks)**

In the following pairs, which is the larger ratio?

Make sure that you show your reasoning for both questions.

a) 3 : 7 or 4 : 9

$$\frac{3 \times 9}{7 \times 9} = \frac{27}{63}$$

$$\frac{4 \times 7}{9 \times 7} = \frac{28}{63}$$

$$\therefore \frac{4}{9} > \frac{3}{7}$$

b) 13 : 12 or 23 : 20

$$\frac{13 \times 5}{12 \times 5}$$

$$= \frac{65}{60}$$

$$\frac{23 \times 3}{20 \times 3} = \frac{69}{60}$$

$$\therefore \frac{23}{20} > \frac{13}{12}$$

Question 6**(4 marks)**

A sport store has a sale on sporting equipment. In the sale basket there are 16 soccer balls, 8 tennis balls and 10 cricket bats.

a) Write the ratio that compares the number of soccer balls to the total pieces of equipment, in simplest form. *Show all steps in your working.*

$$\begin{aligned} & 16 : 34 \\ & = 8 : 17 \end{aligned}$$

b) Write the ratio that compares the number of soccer balls to cricket bats, in simplest form. *Show all steps in your reasoning.*

$$\begin{aligned} & 16 : 10 \\ & = 8 : 5 \end{aligned}$$

Question 7**(2 marks)**If a car uses 35 L of petrol to travel 385 km, how many kms can I travel for every litre of petrol? *Show your reasoning.*

$$\begin{aligned} & \cancel{35} \\ & \frac{385 \text{ km}}{35 \text{ L}} = \\ & 385 \div 35 \text{ km/L} \\ & = 11 \text{ km/L} \end{aligned}$$

\therefore It can travel 11 km.

Section D: Analysis Section (5 marks)

Working out must be shown to gain full marks.

Question 1

(2 + 1 marks)

Francine and John were getting married. They were quoted a price for the wedding reception of \$5700 for 60 guests. However, after the invitations went out, they found that 55 guests were coming.

- (a) What should the new quote for the wedding reception be? Show your working.

$$\frac{\$5700}{60 \text{ guests}} = \$95 / \text{guest}$$

$$55 \times 95 = \$5225 \quad \therefore \text{Cost now} = \$5225$$

- (b) What is the cost per guest?

$$\$95$$

Question 2

(2 marks)

A bathtub is being filled to 120 L. It takes 2.5 minutes to fill the tub with warm, soapy water. What is the rate at which it fills?

$$\begin{aligned} & \frac{120 \text{ L}}{2.5 \text{ min}} \\ &= 120 \div 2.5 \text{ L/min} \\ &= 48 \text{ L/min.} \end{aligned}$$

END OF TEST