

School Name

Mathematics Test 2017

Year 8

Ratio Rates and Proportion

Non Calculator
Section

Skills and Knowledge Assessed:

- Recognise and solve problems involving simple ratios (ACMNA173)
- Solve a range of problems involving rates and ratios, with and without digital technologies (ACMNA188)
- Investigate, interpret and analyse graphs from authentic data (ACMNA180)

Name _____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on the test paper. Calculators are **not** allowed.

Questions 1 – 3 refer to the set of chess pieces shown and described in the table.

Piece	Total Number of Pieces
Kings	2
Queens	2
Bishops	4
Knights	4
Rooks	4
Pawns	16



1. What is the ratio of *Pawns* to *Kings* ?

	:	
--	---	--

2. What is the ratio of *Bishops and Knights* to *Queens*?

	:	
--	---	--

3. What is the ratio of *Knights and Kings* to *Bishops and Rooks*?

<input type="text"/>	:	<input type="text"/>
----------------------	---	----------------------

4. There are 19 players in the Hawks mixed netball squad.
Eight of the players are male.
What is the ratio of male players to female players?

☐ 8 : 11 ☐ 11 : 8 ☐ 8 : 19 ☐ 11 : 19

5. Simplify the ratio 25 : 45.

☐ 1 : 2 ☐ 4 : 9 ☐ 5 : 9 ☐ 12 : 23

6. A ferry transports 864 vehicles in a 12-hour working day.
What is this as a rate in vehicles/ hour?



7. A cheetah can travel at 25 m/s.
How many metres would it cover in a minute
if it maintained this speed?



8. Quentin has a collection of 56 coins. There are
14 silver coins in the collection.
What is the ratio of silver coins to other coins?
(answer in simplest form)

<input type="text"/>	:	<input type="text"/>
----------------------	---	----------------------



9. Which ratio is equivalent to 3 : 4?

☐ 15 : 25☐ 18 : 24☐ 20 : 15☐ 25 : 30

10. Divide 50 in the ratio 3 : 7.

	:	
--	---	--

11. Complete the statement below.

$$40 : 25 = 16 : \boxed{}$$

12. What is the ratio 450 ml : 1.5 litres when written in simplest form.

☐ 1 : 3☐ 2 : 5☐ 3 : 5☐ 3 : 10

13. Divide 2.7 metres in the ratio 1 : 2, giving your answer in cm.

	:	
--	---	--

14. In a car race of 120 km, cars travel at an average speed of 150 km/h.

How long would it take to complete the race?

☐ 45 minutes.☐ 46 minutes.☐ 48 minutes.☐ 50 minutes.

15. Cindy has a resting heart rate of 55 beats per minute.
How many times would her heart beat in a quarter of an hour?

--

16. What is the ratio $0.75 : 1.2$ in simplest form?

☐ $5 : 6$ ☐ $5 : 8$ ☐ $5 : 9$ ☐ $6 : 11$

17. What is the ratio $25 \text{ minutes} : 1 \frac{1}{4} \text{ hours}$ in simplest form ?

☐ $1 : 3$ ☐ $2 : 5$ ☐ $2 : 7$ ☐ $3 : 7$

18. Simplify the ratio $28 : 42 : 35$.

:

:

19. A combine harvester reaps 42 hectares in a 12 hour day.
How many hours would it take to reap 70 hectares?



20. To mix a shade of ink, Lisa uses Cyan, Yellow and Magenta inks in the ratio $4 : 1 : 3$.
How much Yellow and Magenta ink would be needed to mix with 52 ml of Cyan ink?

☐ 9 ml of Yellow and 27 ml of Magenta☐ 11 ml of Yellow and 33 ml of Magenta☐ 12 ml of Yellow and 36 ml of Magenta☐ 13 ml of Yellow and 39 ml of Magenta

School Name
Mathematics Test 2017

Year 8

*Ratio Rates and
Proportion*

Calculator Allowed
Short Answer
Section

Name _____

Answer all questions in the spaces provided on this test paper by:

Writing the answer in the box provided.

or

Shading in the bubble for the correct answer from the four choices provided.

Show any working out on this test paper. Calculators are allowed.

1. On afternoon there were 45 dogs and 80 humans walking along Curacoa Beach.
What is the ratio of dogs to humans in simplest form?

:



2. Simplify the ratio 54 : 36.

:

3. What is the ratio 6.4 : 5 in simplest form?

☐ 8 : 7

☐ 16 : 13

☐ 32 : 25

☐ 128 : 1

4. The ratio of runners to cyclists on a shared track is 12 : 5.
There are 340 runners and cyclists on the track.
How many of them are cyclists?



5. A steam engine uses 132 litres of water when running for 8 hours.
What is the rate of water use in litres/h?

☐ 16.0 L/h☐ 16.5 L/h☐ 17.5 L/h☐ 18.0 L/h

6. The bottles of drink in the refrigerator at the gym are sports drinks and juices in the ratio 15 : 8.
There are 90 bottles of sports drink.
How many bottles are in the refrigerator altogether?

7. The scale on a map is 1 : 500.
Liza measures the distance to her friend's house on the map to be 650 mm.
What is the actual distance to her friend's house?

☐ 325 m☐ 350 m☐ 375 m☐ 650 m

8. The ratio 42 hours : 2½ days in simplest form, without using units, is;

☐ 2 : 5☐ 3 : 4☐ 3 : 5☐ 7 : 10

9. Romy is a basketballer who has a scoring rate of 12.5 points/game.

How many games would it take her to score 400 points?



☐ 28 games ☐ 30 games ☐ 31 games ☐ 32 games

10. Writing and printing paper is classified by the number of grams/m² (or GSM).

A single sheet of a particular paper has an area of about 0.06 m², and is rated at 90 GSM.

What would be the mass of 500 sheets of this A4 paper?

☐ 300 g ☐ 1.8 kg ☐ 2.7 kg ☐ 3.0 kg

11. Wendy travels to work by bus, then train then walks.

Each week she spends 2 hours on buses, 6 hours on trains and 30 minutes walking.

What is the ratio, in simplest terms, of time spent on Buses : Trains : Walking.

: :

12. Simplify $1\frac{1}{7} : \frac{4}{5}$.

☐ 7 : 5 ☐ 8 : 5 ☐ 9 : 5 ☐ 10 : 7

13. A mix for a smoothie has bananas, strawberries and mango in the ratio 6 : 2 : 3 by weight.
How many grams of mangos would be needed for a smoothie which weighed 330 g?

14. Milton wears a pedometer to count his steps.

He finds that he averages 1500 steps/hour when he is at work, 400 steps/hour when he is awake at home and 50 steps/minute while he is doing his daily exercise.

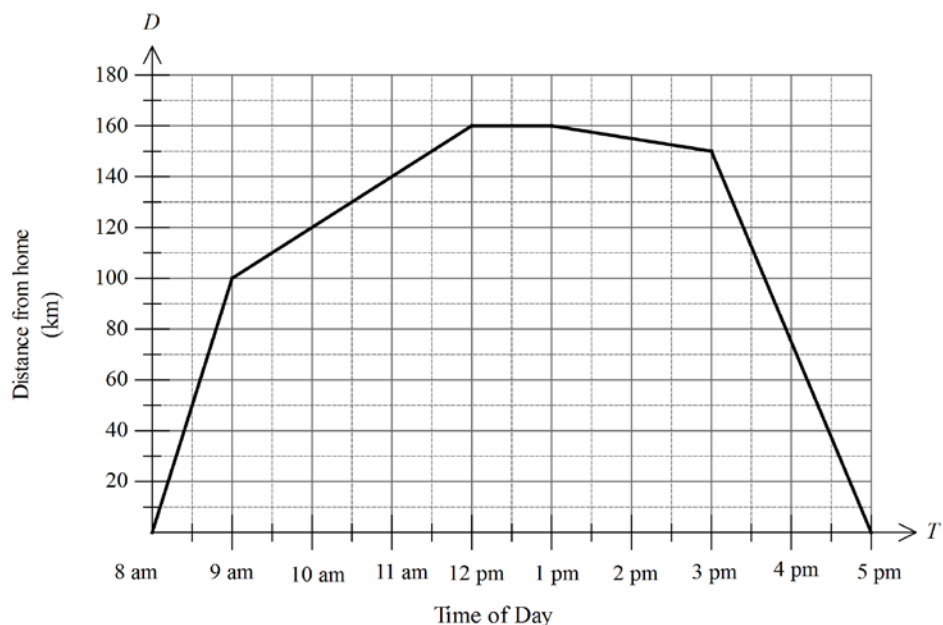
What is his total steps for a day where he was at work for 8 hours and at home for the remaining hours of the day where he slept for 7 hours and exercised for 2 hours?

15. The payment for a job is divided between Andrew, Basil and Chuck in the ratio 4 : 3 : 6. If Andrew and Basil received \$630 between them, how much did Chuck receive?

Questions 16 - 18 refer to the following.

The distance-time graph represents Donna's day out.

Her dad gave her a lift to her friend's house, where they got on their bikes and cycled to a picnic area where they had lunch. After lunch, they walked their bikes to the station, where Donna caught a train home.



16. What time did they arrive at the picnic area for lunch?

☐ 9:00 am

☐ 12:00 pm

☐ 1:00 pm

☐ 3:00 pm

17.

At what average speed (in km/h) did they cycle to the picnic ground?

18.

What was the difference in the speeds of her dad's driving and the train she caught home?

- ☐ Her dad's driving was faster by 25 km/h.
- ☐ Her dad's driving was faster by 40 km/h
- ☐ Her dad's driving was faster by 60 km/h
- ☐ Her dad's driving was slower by 25 km/h

School Name
Mathematics Test 2017

Year 8

*Ratio Rates and
Proportion*

Non Calculator Section

ANSWERS

Question	Working and Answer
1.	Pawns : Kings = $16 : 2 = \mathbf{8 : 1}$
2.	Bishops and Knights : Queens = $8 : 2 = \mathbf{4 : 1}$
3.	Knights and Kings : Bishops and Rooks = $6 : 8 = \mathbf{3 : 4}$
4.	Female players = $19 - 8 = 11$ Ratio male : female = $8 : 11$ 1st Answer
5.	$25 : 45 = 5 : 9$. 3rd Answer
6.	Rate = $864 \div 12 = \mathbf{72 \text{ vehicles/ hour}}$
7.	Distance in 1 minute = $25 \times 60 = \mathbf{1500 \text{ metres}}$
8.	From 56 coins if 14 are silver, $56 - 14 = 42$ coins are other metals Silver : Other = $14 : 42$ $= \mathbf{1 : 3}$
9.	$3 : 4 = 6 : 8 = 9 : 12 = 12 : 16 = 15 : 20 = \underline{18 : 24}$ 2nd Answer

Question	Working and Answer
10.	<p>If dividing in the ratio 3 : 7, we are dividing into 10 parts. 50 divided into 10 parts is 5 in each part. Quantities are $3 \times 5 : 7 \times 5 = \mathbf{15 : 35}$</p>
11.	<p>$40 : 25 = 8 : 5$ $= 16 : \mathbf{10}$</p>
12.	<p>$450 \text{ ml} : 1.5 \text{ litres} = 450 \text{ ml} : 1500 \text{ ml}$ $= 45 : 150$ $= 9 : 30$ $= 3 : 10$ 4th Answer</p>
13.	<p>$2.7 \text{ m} = 270 \text{ cm}$ Dividing in ratio 1 : 2 is 3 parts. Each part = $270 \div 3 = 90 \text{ cm}$ 1 : 2 becomes 90 cm : 180 cm</p>
14.	<p>Time = $\frac{D}{S}$ $= \frac{120}{150}$ $= \frac{4}{5} \text{ hour}$ $= \frac{4}{5} \times 60 \text{ min}$ $= 48 \text{ minutes}$ 3rd Answer</p>
15.	<p>A quarter hour = 15 min Beats in 15 min = $15 \times 55 = \mathbf{825 \text{ beats}}$</p>
16.	<p>$0.75 : 1.2 = 0.75 : 1.20$ $= 75 : 120$ $= 15 : 24$ $= 5 : 8$ 2nd Answer</p>

Question	Working and Answer
17.	$25 \text{ minutes} : 1\frac{1}{4} \text{ hours} = 25 \text{ min} : 75 \text{ min}$ $= 1 : 3$ 1st Answer
18.	$28 : 42 : 35 = \mathbf{4 : 6 : 5}$ (Dividing all by 7)
19.	$42 \text{ ha in } 12 \text{ hrs} = 42 \div 12$ $= 3.5 \text{ ha/hr}$ For 70 ha, time = $70 \div 3.5$ $= \frac{700}{35}$ $= \mathbf{20 \text{ hours}}$
20.	Cyan : Yellow : Magenta = $4 : 1 : 3$ $= 52 : Y : M$ Factor = $52 \div 4 = 13$ $Y = 1 \times 13 = 13 \text{ ml}$ $M = 3 \times 13 = 39 \text{ ml}$ 13 ml of Yellow and 39 ml of Magenta 4th Answer

School Name
Mathematics Test 2017

Year 8

*Ratio Rates and
Proportion*

Calculator Allowed
Short Answer
Section

ANSWERS

Question	Working and Answer
1.	Dogs : Humans = 45 : 80 = 9 : 16
2.	54 : 36 = 6 : 4 = 3 : 2
3.	6.4 : 5 = 64 : 50 = 32 : 25 3rd Answer
4.	Runners : cyclists = 12 : 5 Together there are $12 + 5 = 17$ parts Each part = $340 \div 17 = 20$ Number Cyclists = $5 \times 20 = \mathbf{100}$
5.	Rate = $132 \text{ litres} \div 8 \text{ hours}$ = 16.5 L/hr 2nd Answer

6.	$S : J = 15 : 8$ $= 90 : J$ Factor = $90 \div 15 = 6$ $J = 6 \times 8 = 48$ Total Drinks = $90 + 48 = \mathbf{138 \text{ bottles}}$
7.	Distance = $650\text{mm} \times 500$ $= 325\,000 \text{ mm}$ $= 325 \text{ metres}$ 1st Answer
8.	$42 \text{ hours} : 2\frac{1}{2} \text{ days} = 42 \text{ hours} : 60 \text{ hours}$ $= 7 : 10$
9.	No Games = $400 \div 12.5$ $= 32 \text{ games}$ 4th Answer
10.	Area of 500 sheets = $500 \times 0.06 = 30 \text{ m}^2$. Mass of 500 sheets = $30 \times 90 \text{ g} = 2700 \text{ g} = 2.7 \text{ kg}$ 3rd Answer
11.	$B : T : W = 2 \text{ hours} : 6 \text{ hours} : 30 \text{ minutes}$ $= 120 \text{ min} : 360 \text{ min} : 30 \text{ min}$ $= \mathbf{4 : 12 : 1}$
12.	$1\frac{1}{7} : \frac{4}{5} = \frac{8}{7} : \frac{4}{5}$ $= \frac{40}{35} : \frac{28}{35}$ $= 40 : 28$ $= 10 : 7$ 4th Answer
13.	Total parts = $6 + 2 + 3 = 11$ Each part = $330\text{g} \div 11 = 30\text{g}$ Mangos are 3 parts = $3 \times 30 = \mathbf{90 \text{ g.}}$

14.	<p>At work, number of steps = $1500 \times 8 = 12000$</p> <p>At home exercising = $50 \times 60 \times 2 = 6000$</p> <p>At home awake = $(24 - 8 - 7 - 2) \times 400 = 7 \times 400 = 2800$</p> <p>Total for day = $2800 + 6000 + 12000 = \mathbf{20\ 800\ steps}$</p>
15.	<p>Andrew + Basil make up 7 parts</p> <p>Each part = $\\$630 \div 7 = \\90</p> <p>Chuck receives 6 parts = $6 \times \\$90 = \mathbf{\\$540}$</p>
16.	<p>Lunch time is where they are not moving, which starts at 12 pm.</p> <p>2nd Answer</p>
17.	<p>Cycled from 100 to 160 km from home, so they went 60 km.</p> <p>It took from 9 am to 12 pm, so 3 hours.</p> <p>Speed = $60 \div 3 = \mathbf{20\ km/h}$</p>
18.	<p>Lift went from home to 100 km from home, so she went 100 km.</p> <p>It took from 8 am to 9 am, so 1 hours.</p> <p>Speed = $100 \div 1 = 100\ km/h$</p> <p>Train went from 150 km from home, to home, so she went 1500 km.</p> <p>It took from 3 pm to 5 pm, so 2 hours.</p> <p>Speed = $150 \div 2 = 75\ km/h$</p> <p>Her dad, driving was 25 km/h faster.</p> <p>1st Answer</p>