

High School Mathematics Test 2014

Year 8

Ratio Rates and Proportion

Non Calculator
Section

- 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 – 2 refer to the following.

On a table there are some mugs and some glasses.



1. What is the ratio of mugs to glasses in simplest form?

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2. The cupboard has mugs and glasses in the same ratio as shown above.
There are 18 mugs in the cupboard.
How many glasses are there in the cupboard?

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 glasses.

3. The cupboard holds only mugs and glasses.
What fraction of the cupboard's contents are mugs?

4.	Freya has 18 trophies on her shelf. Twelve of them are for netball and the rest are for dancing. The ratio of netball trophies to dancing trophies is: <input type="checkbox"/> 1 : 2 <input type="checkbox"/> 2 : 1 <input type="checkbox"/> 2 : 3 <input type="checkbox"/> 3 : 2
5.	The ratio 8 : 20 when written in simplest form is: <input type="checkbox"/> 2 : 3 <input type="checkbox"/> 2 : 5 <input type="checkbox"/> 5 : 2 <input type="checkbox"/> 3 : 5
6.	A harvester covers a 120 hectare paddock in 5 hours. What is this as a rate in hectares per hour? <div style="text-align: center;"><input type="text"/> ha/h.</div>
7.	A car travels at 45 km/h. How far would it travel in 8 hours? <div style="text-align: center;"><input type="text"/> km.</div>
8.	Dina has 50 books, 15 of which are biographies and the rest are novels. What is the ratio of biographies to novels? (answer in simplest form) <div style="text-align: right;"><input type="text"/> : <input type="text"/></div>
9.	Which ratio is equivalent to 3 : 4? <input type="checkbox"/> 4 : 6 <input type="checkbox"/> 6 : 5 <input type="checkbox"/> 9 : 16 <input type="checkbox"/> 12 : 16
10.	Write the ratio 36 : 16 in simplest form. <div style="text-align: right;"><input type="text"/> : <input type="text"/></div>
11.	Complete the statement below. <div style="text-align: center;">$40 : 30 = 16 :$<input type="text"/></div>
12.	Write the ratio 4.5 : 1.5 in simplest form. <div style="text-align: right;"><input type="text"/> : <input type="text"/></div>

13.	Divide 200 in the ratio 3 : 2.	<div><div></div><div>:</div><div></div></div>
14.	A car travels 120 km using 12 litres of fuel. What is the rate of use in km/litre? <input type="checkbox"/> 6 km/litre. <input type="checkbox"/> 8 km/litre. <input type="checkbox"/> 10 km/litre. <input type="checkbox"/> 12 km/litre.	
15.	A tiler can lay 12 m ² /hour. How long would it take to lay an area of 66 m ² ? <div></div> hours.	
16.	What is the ratio $\frac{4}{5} : \frac{3}{10}$ in simplest form? <input type="checkbox"/> 2 : 3 <input type="checkbox"/> 3 : 4 <input type="checkbox"/> 4 : 3 <input type="checkbox"/> 8 : 3	
17.	What is the ratio 30 minutes : 1¼ hours in simplest form ? <input type="checkbox"/> 3 : 4 <input type="checkbox"/> 3 : 5 <input type="checkbox"/> 2 : 5 <input type="checkbox"/> 45 : 75	
18.	Divide 800 marbles in the ratio 9: 1.	<div><div></div><div>:</div><div></div></div>
19.	Three kilograms of cherries is divided between Ken and Leo in the ratio 4 : 1. How many grams of cherries does Ken get? <input type="checkbox"/> 600 g <input type="checkbox"/> 750 g <input type="checkbox"/> 2 000 g <input type="checkbox"/> 2 400 g	
20.	Marcie mixes concrete which consists of sand, aggregate and cement in the ratio 5 : 3 : 1. If she needs 36 buckets of concrete how many buckets of sand will she need? <input type="checkbox"/> 4 buckets. <input type="checkbox"/> 12 buckets. <input type="checkbox"/> 20 buckets. <input type="checkbox"/> 24 buckets.	

High School Mathematics Test 2014

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 the test paper. Calculators are allowed.

1. In a town there are 400 adults and 250 children.
What is the ratio of adults to children in simplest form?

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2. Complete the statement below.

$$24 : 32 = 3 : \boxed{}$$

3. What is the ratio 1.25 : 0.5 in simplest form?

☐ 2 : 5

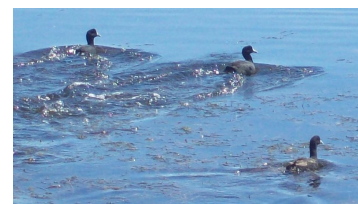
☐ 5 : 2

☐ 5 : 20

☐ 50 : 2

4. The ratio of ducks to swans on a lake is 15 : 7.
There are 110 ducks and swans in total on the lake.
How many ducks are there?

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5. To mix a liquid fertiliser, the label says to mix 45 g of fertiliser in a 9 litre watering can of water. What is this as a rate in g/L?

☐ 5 g/L

☐ 9 g/L

☐ 15 g/L

☐ 405 g/L

6.	<p>Eddie worked out that the time he spent at home and at work was in the ratio 6: 5 respectively. He spent 45 hours at work. How many hours did he spend at home?</p> <div></div> hours
7.	<p>A map has a scale of 1 : 20 000. Liza measures the distance between two houses on the map to be 12 cm. How far apart are the houses?</p> <p><input type="checkbox"/> 1.2 km <input type="checkbox"/> 2.4 km <input type="checkbox"/> 4.8 km <input type="checkbox"/> 12 km</p>
8.	<p>The ratio 500 g : 1.5 kg in simplest form, without using units, is;</p> <p><input type="checkbox"/> 1 : 2 <input type="checkbox"/> 1 : 1.5 <input type="checkbox"/> 1 : 3 <input type="checkbox"/> 1 : 5</p>
9.	<p>Mitchell is a cricketer who has a bowling strike rate of 4.5 wickets/innings. How many wickets did he get if he played 20 innings?</p> <div></div> wickets
10.	<p>Tara is laying carpet tiles in her house and it takes her 6 hours to lay 45 m² of carpet tiles. At what rate did she lay the tiles?</p> <div></div> m ² /hour
11.	<p>Amber records how she spends 8 hours at work one day. She spend the time filing, typing and copying in the ratio 6 : 7 : 3. How long did she spend typing?</p> <p><input type="checkbox"/> 2 hours <input type="checkbox"/> 2.5 hours <input type="checkbox"/> 3 hours <input type="checkbox"/> 3.5 hours</p>
12.	<p>Which of these ratios is equivalent to 5 : 14?</p> <p><input type="checkbox"/> $\frac{1}{4} : \frac{7}{10}$ <input type="checkbox"/> $\frac{2}{5} : \frac{7}{10}$ <input type="checkbox"/> $\frac{1}{2} : \frac{7}{10}$ <input type="checkbox"/> $\frac{4}{5} : \frac{7}{10}$</p>
13.	<p>Luke has scored at a rate of 18 points/game for his footy team. If he has scored 342 points, how many games has he played?</p> <div></div>

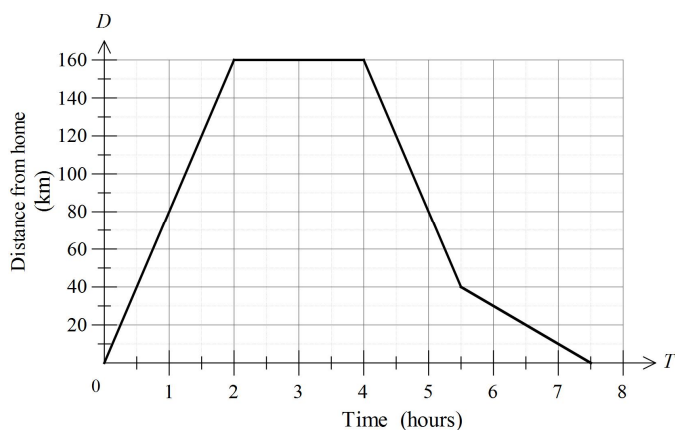
14.

Deanna drives her car a distance of 450 km at an average speed of 90 km/h.
How much less time would the journey have taken if she had averaged 100 km/h?

It would take minutes less.

Questions 15 and 16 refer to the following.

The distance-time graph represents Thomas' journey from home in Melbourne to Bendigo for a meeting and then back home.



15.

How long did Thomas stay in Bendigo?

☐ 1 hour☐ 1.5 hours☐ 2 hours☐ 4 hours

16.

At what average speed did Thomas travel on his way to Bendigo?

km/h.

17.

On his journey home, he had a good run until heavy traffic slowed his journey.
How far from home was he when he met the heavy traffic?

km from home.

18.

By how much was his speed lowered by the heavy traffic?

☐ The speed dropped from 90 km/h to 10 km/h.☐ The speed dropped from 80 km/h to 10 km/h.☐ The speed dropped from 90 km/h to 20 km/h.☐ The speed dropped from 80 km/h to 20 km/h.

Ratio Rates and Proportion ANSWERS

Non Calculator Section (1 mark each)

7

18.	$800 \times \frac{9}{10} : 800 \times \frac{1}{10} = 720 : 80.$	
19.	$3 \text{ kg} = 3000\text{g}$ Ken gets $\frac{4}{5}$ of them. $\frac{4}{5} \times 3000 = 4 \times 600 = 2400 \text{ g}$	4 th Answer
20.	36 buckets of concrete is 4 times the total of the contents(9 parts). Amount of sand = $4 \times 5 = 20$ buckets.	(3 rd Answer)

High School Mathematics Test 2014

Calculator Allowed Short Answer Section (1 mark each)
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Q no		Answer
1.	$400 : 250 = 8 : 5$ (dividing by 50)	
2.	$24 : 32 = 3 : 4$	
3.	$1.25 : 0.5 = 125 : 50$ $= 5 : 2$	(2 nd Answer)
4.	Number of Ducks = $\frac{15}{22} \times 110$ $= 75$ ducks	
5.	Rate = $45g \div 9 L = 5 g/L$	(1 st Answer)
6.	$H : W = 6 : 5 = H : 45$ (Multiplied by 9) Hours at home = $6 \times 9 = 54$ hours	
7.	Real distance is 20 000 times the map distance. Distance between houses = $12cm \times 20000$ $= 240\,000\text{ cm}$ $= 240\,000 \div 100\text{ m}$ $= 2400\text{ m}$ $= 2400 \div 1000\text{ km}$ $= 2.4\text{ km}$	(2 nd Answer)
8.	$500\text{ g} : 1.5\text{ kg} = 500 : 1500$ $= 5 : 15$ $= 1 : 3$	(3 rd Answer)
9.	No wickets = $4.5 \times 20 = 90$ wickets.	
10.	Rate = $45 \div 6 = 7.5\text{ m}^2/\text{h}$	
11.	Time typing = $\frac{7}{16} \times 8$ $= 3.5$ hours	4 th Answer
12.	$\frac{1}{4} : \frac{7}{10} = \frac{5}{20} : \frac{14}{20} = 5 : 14$	(1 st Answer)
13.	No Games = $342 \div 18 = 19$ games.	
14.	At 90 km $\div h$ time taken = $450 \div 90 = 5$ hrs. At 100 km $\div h$ time taken = $450 \div 100 = 4.5$ hrs. It would take 30 minutes less.	
15.	2 hours	(3 rd Answer)
16.	Speed = $160 \div 2 = 80\text{ km/h}$	

17.	40 km from home (when gradient of line changes)	
18.	$\text{Speed before traffic} = \frac{120\text{km}}{1.5h} = 80 \text{ km/h}$ $\text{Speed in heavy traffic} = \frac{40\text{km}}{2h} = 20 \text{ km/h}$	4 th Answer