

High School Mathematics Test 2013

Year
8

Ratio 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)

Name _____

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

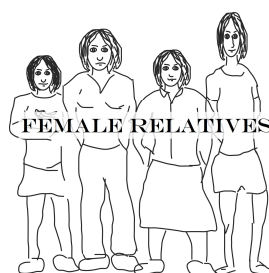
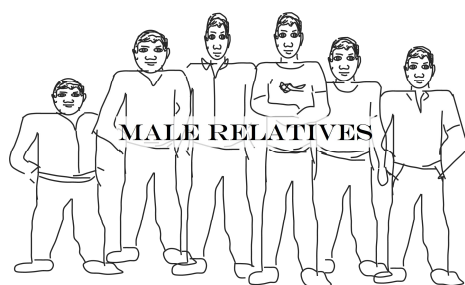
Writing the answer in the box provided.

or

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

Show any working out on the test paper.

Questions 1 – 5 refer to the diagram below of a group of relatives at a family barbeque.



1. What is the ratio of the female relatives to the male relatives in simplest form?

☐ 6 : 4

☐ 4 : 6

☐ 2 : 3

☐ 3 : 4

2. What is the ratio of the male relatives to all of the relatives in simplest form?

☐ 6 : 4

☐ 6 : 10

☐ 3 : 5

☐ 3 : 2

3. What fraction of the relatives are female?

☐ $\frac{2}{3}$

☐ $\frac{2}{5}$

☐ $\frac{3}{5}$

☐ $\frac{3}{2}$

4. Write the percentage of the relatives who are male.

5. Two more female relatives arrived late to the barbeque.
Write the new ratio of the female relatives to the male relatives in simplest form.

 :

6. Brodie finds that $\frac{5}{8}$ of his friends enjoy cycling and the rest don't.

The ratio of those who enjoy cycling to those who don't is:

☐ 3 : 5☐ 5 : 8☐ 5 : 3☐ 8 : 5

7. The ratio 18 : 24 when written in simplest form is:

☐ 3 : 4☐ 9 : 12☐ 6 : 8☐ 4 : 3

8. Alex has 40 DVDs, 15 of which are comedies and the rest are dramas. What is the ratio of comedies to dramas?

	:	
--	---	--

9. Which ratio is **not** equivalent to 2 : 3?

☐ 4 : 6☐ 12 : 20☐ 10 : 15☐ 8 : 12

10. Write the ratio 35 : 20 in simplest form.

	:	
--	---	--

11. Complete the statement below.

$$24 : 16 = 6 : \boxed{}$$

12. There are four pairs of ratios below.
Which pair has two ratios which are both equivalent to 24 : 30?

☐ 12 : 15 and 6 : 8.☐ 6 : 8 and 8 : 10.☐ 4 : 5 and 12 : 16.☐ 12 : 15 and 4 : 5.

13. Write the ratio 2.4 : 0.9 in simplest form.

	:	
--	---	--

14. What is the ratio $\frac{2}{3} : \frac{1}{6}$ in simplest form?

☐ 4 : 1☐ 6 : 1☐ 3 : 2☐ 4 : 3

15. What is the ratio **45 minutes : $1\frac{1}{4}$ hours** in simplest form ?

☐ 3 : 4☐ 3 : 5☐ 1 : 5☐ 45 : 75

16. Divide 300 beads in the ratio 7 : 3.

	:	
--	---	--

17. Two kilograms of cherries is divided between Ken and Leo in the ratio 4 : 1. How many grams of cherries does Leo get?

☐ 1 000 g ☐ 500 g ☐ 400 g ☐ 200 g

18. Marcie mixes concrete which consists of sand, aggregate and cement in the ratio 5 : 3 : 1. If she has 3 buckets of cement how many buckets of sand and aggregate will she need?

- ☐ 15 buckets of sand and 6 buckets of aggregate.
☐ 10 buckets of sand and 6 buckets of aggregate.
☐ 15 buckets of sand and 9 buckets of aggregate.
☐ 10 buckets of sand and 9 buckets of aggregate.

19. To mix a tonic you add 10 g of powder to 0.25 litres of water. What is this as a rate in g/L?

☐ 20 g/L ☐ 40 g/L ☐ 80 g/L ☐ 160 g/L

20. A tractor ploughs a 150 hectare paddock in 3 hours. What is this as a rate in hectares per hour?

ha/h.

21. Kirrily earns \$8 /hour in her weekend job. How many hours must she work to earn \$76 to pay for a concert ticket?

hours.

22. A paddle steamer uses coal in its engine at a rate of 25 kg/h. How many hours could the engine run, if it has 0.5 tonnes of coal left in its supply bin?

☐ 2 hours ☐ 5 hours ☐ 20 hours ☐ 50 hours



High School Mathematics Test 2013

Year
8

Ratio 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.

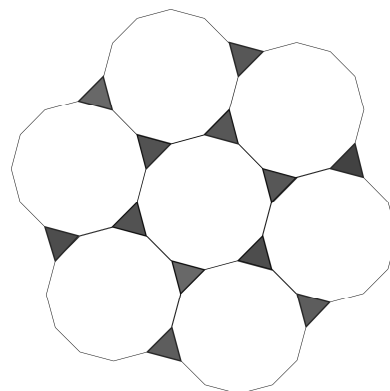
or

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

Show any working out on the test paper.

Calculators are allowed for this section.

1. A tiling pattern is made up of triangles and dodecagons (12 sided figures).
What is the ratio of Dodecagons to Triangles?

 : 

2. If the pattern above was copied several times until there were 49 dodecagons, how many triangles would there be?

3. What is the ratio 2.4 : 0.12 in simplest form?

☐ 1 : 2

☐ 2 : 1

☐ 20 : 1

☐ 200 : 1

4. Complete the statement below.

$$16 : 12 = 12 : \boxed{}$$

-
5. Which of these ratios is equivalent to $5 : 7$?

☐ $\frac{1}{5} : \frac{7}{10}$

☐ $\frac{1}{4} : \frac{7}{10}$

☐ $\frac{2}{5} : \frac{7}{10}$

☐ $\frac{1}{2} : \frac{7}{10}$

-
6. Justin and Kristie buy a house together, and they contribute the money for the purchase in the ratio $5 : 4$ respectively.
The house cost them \$450 000.
How much did Kristie contribute?



-
7. Steph records how she spends 6 hours on a Saturday afternoon.
She finds that she spend the time doing homework, playing soccer and watching a video in the ratio $5 : 4 : 3$.
How long did she spend playing soccer?

☐ 30 minutes☐ 90 minutes☐ 120 minutes☐ 150 minutes

-
8. Karrie found that the amount of fuel she used in her car and in her motorbike was in the ratio $12 : 5$ respectively.
She used 7.5 litres in the motorbike.
How many litres did she use in the car?

litres

-
9. Tony is a cricketer who has a run rate of 4.2 runs/over.
How many runs will he get at this rate if he bats for 15 overs?

runs

-
10. Lesley is painting her house and it takes her 5 hours to paint 120 m^2 of her walls.
At what rate did she paint?

 m^2/hour

High School Mathematics Test 2013

Year
8

Ratio and Proportion

Calculator Allowed
Longer Answer
Section

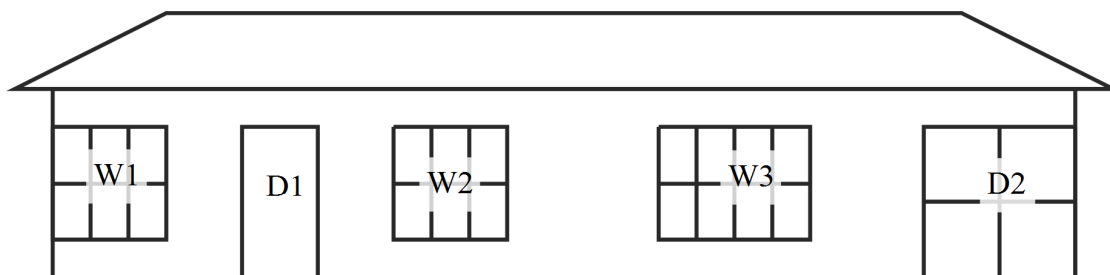
Name _____

Write all working and answers in the spaces provided on this test paper.

Marks

1. Susie spends 4 hours on Saturday working in her garden. Of this time, one and a half hours is spent mowing, half an hour spraying bugs and the remaining time weeding.
- (a) What is the ratio of the time she spent mowing as to spraying as to weeding. **1**
-
-
- (b) If she spent 6 hours on Sunday allotted in the same ratio, how long would she have spent on each activity? **2**
-
-
- (c) On Saturday she mowed 7 200 m² of her lawn. At what rate did she mow (in m²/minute)? **1**
-
-
- (d) What is this rate in hectares/hour? **1**
(1 hectare = 10 000 m²)
-
-

2. A scale drawing of a house is shown below.



Scale 1 : 100

- (a) What is the length (in metres) of the actual house at ground level?

1

.....

.....

- (b) What is the area of the actual window W2?

1

.....

.....

- (c) What is the ratio of the areas of the windows W2 as to W3?

1

.....

.....

High School Mathematics Test 2013 Ratio and Proportion

ANSWERS

Non Calculator Section

1.	2 : 3
2.	3 : 5
3.	$\frac{2}{5}$
4.	60%
5.	1 : 1
6.	5 : 3
7.	3 : 4
8.	3 : 5
9.	12 : 20
10.	7 : 4
11.	4
12.	12 : 15 and 4 : 5.

13.	8 : 3
14.	4 : 1
15.	3 : 5
16.	210 : 90
17.	400 g
18.	15 of sand and 9 of aggregate.
19.	40 g/L
20.	50 ha/h
21.	$9\frac{1}{2}$ hours
22.	20 hours

Calculator Allowed Section

1.	7 : 12
2.	84
3.	20 : 1
4.	9
5.	$\frac{1}{2} : \frac{7}{10}$
6.	\$200 000
7.	120 minutes
8.	18 litres
9.	63 runs
10.	24 m ² /hr

Calculator Allowed Longer Answer Section		
1.	(a) $1\frac{1}{2}h : \frac{1}{2}h : 2h = 3 : 1 : 4$	1
	(b) Mowing is $\frac{3}{8}$ of the time. $\frac{3}{8} \times 6 \text{ hrs} = \frac{18}{8} = 2\frac{1}{4} \text{ hours}$ Spraying is $\frac{1}{8}$ of the time. $\frac{1}{8} \times 6 \text{ hrs} = \frac{6}{8} = \frac{3}{4} \text{ hour}$ Weedng is $\frac{1}{2}$ of the time. $\frac{1}{2} \times 6 \text{ hrs} = 3 \text{ hours}$	2
	(c) Rate = $7200 \div 90 = 80 m^2/\text{min}$	1
	(d) Rate = $0.72 \div 1.5 = 0.48 \text{ ha/hr}$	1
2.	(a) Length of scale drawing is 135 mm. Length of actual house is $135 \times 100 = 13\,500 \text{ mm} = 13.5 \text{ m}$.	1
	(b) Scale window measures 15 mm square so actual window is 1.5 m square. Area = $1.5^2 = 2.25 m^2$.	1
	(c) Using panes ratio is $6 : 8 = 3 : 4$. Using areas W3 is $1.5 \times 2 = 3 m^2$ Ratio is $2.25 : 3 = 9 : 12 = 3 : 4$	1