

**Topic test 3****Ratios and rates**

- Time allowed: 45 minutes
- Part A: 20 multiple-choice questions (40 marks)
- Part B: 15 free-response questions (60 marks)

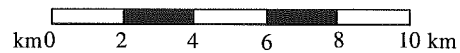
Name: \_\_\_\_\_

**Part A****20 multiple-choice questions****2 marks each: 40 marks****Circle the correct answer.**

- 1 Which ratio is equivalent to 5 : 7?  
A 20 : 35                      B 25 : 45  
C 25 : 49                      D 40 : 56
- 2 Simplify 2.25 : 7.5.  
A 3 : 10                      B 3 : 1  
C 1 : 3                      D 2 : 7
- 3 At the school canteen, the ratio of hot dogs to meat pies sold was 3 : 4. If there were 240 hot dogs sold, how many pies were sold?  
A 180                      B 280  
C 320                      D 340
- 4 The scale on a map is 5 cm : 1 km. This is equivalent to:  
A 1 : 5000                      B 1 : 50 000  
C 1 : 2000                      D 1 : 20 000
- 5 Simplify 40 min : 2 hours 40 min.  
A 1 : 8                      B 3 : 8  
C 1 : 4                      D 1 : 6
- 6 Simplify  $\frac{2}{5} : \frac{5}{8}$ .  
A 1 : 4                      B 4 : 5  
C 1 : 16                      D 16 : 25
- 7 A widescreen TV has a 'length : width' ratio of 16 : 9. If its length is 50 cm, what is its width, to the nearest centimetre?  
A 18 cm                      B 28 cm  
C 34 cm                      D 89 cm
- 8 Concrete mix is made from 3 parts gravel, 2 parts sand and 1 part cement. How much concrete mix can be made with 15 kg of gravel?  
A 5 kg                      B 30 kg  
C 45 kg                      D 90 kg
- 9 There are 969 students and 68 teachers at Westvale College. What is the teacher : student ratio?  
A 57 : 4                      B 61 : 4  
C 4 : 57                      D 4 : 61
- 10 Sanjeev made 55 runs in 12 overs of cricket. Calculate his run rate in runs/over.  
A 2.18                      B 1.31  
C 4.58                      D 6.60
- 11 A car travelled 510 km in 6 hours. How far will it travel in 5 hours at the same speed?  
A 340 km                      B 408 km  
C 425 km                      D 332 km
- 12 Peter earned \$571.52 for a week in which he worked from 9:00am to 5:00pm on Monday to Friday and 9:00am to 4:00pm on Saturday. What was his average hourly rate of pay?  
A \$8.22                      B \$12.16  
C \$24.85                      D \$14.29
- 13 Andrew's heartbeat rate is 74 beats/minute. How long will it take his heart to beat 1000 times?  
A 20 min 33 s                      B 13 min 31 s  
C 13 min 51 s                      D 20 min 56 s
- 14 Fiona's car travels 180 km on 24.3 L of petrol. Calculate its fuel consumption in L/100 km.  
A 4.4                      B 0.1  
C 13.5                      D 7.4
- 15 Convert 110 km/h to m/s.  
A 3.1 m/s                      B 9.2 m/s  
C 30.6 m/s                      D 91.7 m/s
- 16 Hurlstone Shire has a population of 48 000. If 504 babies were born in the shire last year, calculate the birth rate in births/1000 people.  
A 95.2                      B 9.52  
C 10.5                      D 105

**Topic test 3: Ratios and rates *continued***

- 17 Joe bet on a horse which won at odds of 9 : 4 (winnings : bet). If he bet \$12, how much did he win?  
 A \$25                      B \$26  
 C \$27                      D \$29
- 18 If an information phone call costs 22 cents per 25 seconds, how much will an 8-minute call cost?  
 A \$4.22                    B \$4.40  
 C \$7.04                    D \$9.09
- 19 Australia has a population of 20 834 000 and an area of 7 682 300 km<sup>2</sup>. Calculate its population density in persons/km<sup>2</sup>.  
 A 1.60                      B 2.85  
 C 3.69                      D 2.71
- 20 If 1 Australian dollar = £0.42, convert £45 to Australian dollars.  
 A \$189.00                B \$93.75  
 C \$93.33                 D \$107.14
- 24 (2 marks) An 18 carat gold ring has a gold to other metals ratio of 18 : 6. If the ring's mass is 15 g, what is the mass of the gold in it?
- 25 (4 marks) Complete each equivalent ratio:  
 a 6 : 15 = \_\_\_\_ : 60.  
 b 7 : 2 = 28 : \_\_\_\_.
- 26 (2 marks) Josh and Samantha own a business and share a profit of \$7520 in the ratio 3 : 5. What is Josh's share?
- 27 (4 marks) This is the scale shown on a map.



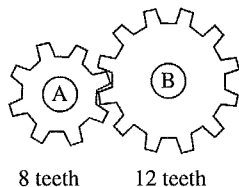
- a Express this scale as a simplified ratio.
- b What does a scaled distance of 8 cm on this map represent?

**Part B**

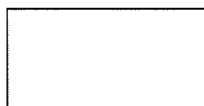
15 free-response questions  
 60 marks

Show working where appropriate.

- 21 (6 marks) Simplify each ratio:  
 a 24 : 15  
 b 4 : 20 : 10  
 c 75 cm : 8 m
- 22 (3 marks) for this pair of gears, find how many times gear B will turn if gear A turns 60 times



- 23 (2 marks) A rectangle's length is double its width. Find the ratio of its perimeter to its length in simplest form.

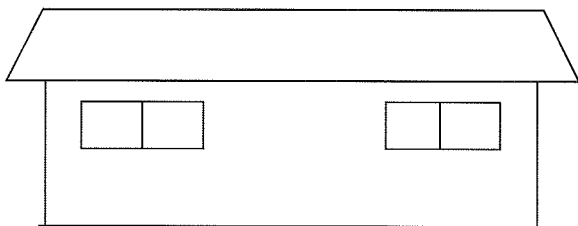


- 29 (3 marks) At the football game, the ratio of Dragon to Tiger supporters was 8 : 7. If there were 45 210 supporters, how many supported:

- a the Dragons?  
 b the Tigers?

### Topic test 3: Ratios and rates *continued*

- 30 (4 marks) This diagram of house has a scale of 1 : 125



- a Measure and calculate in metres the actual length of the top of the roof.
- b Draw correctly to scale on the diagram a door that has a height of 2 metres.
- 31 (4 marks) Bounta washes 20 cars in 9 hours 20 minutes.
- a How long does it take him to wash one car?
- b How many cars can he wash in 4 hours 12 minutes?

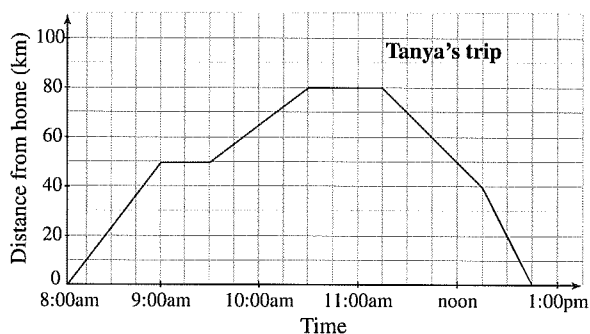
- 32 (4 marks) Jenny's car has a fuel consumption of 11.2 L/100 km.

- a How much fuel is needed to travel 220 km?
- b What distance can be travelled on a full tank of 65 L? Answer to the nearest kilometre.

- 33 (4 marks) Fingernails grow at a rate of 0.19 mm/day.

- a How long will a fingernail grow after 2 weeks?
- b How many days will it take a fingernail to grow 1 cm?

- 34 (12 marks) This travel graph shows Tanya's trip to the city, 80 km from home.



- a At what speed was Tanya travelling before 9:00am?
- b What happened at 9:00am?
- c For how long did Tanya stay in the city?
- d At 12:15pm, did Tanya's speed increase or decrease?
- e When was Tanya halfway from the city to home?
- f When did Tanya arrive home?
- g What was the total distance travelled by Tanya over the day?

- 35 (4 marks) Convert:

- a \$41 460/year to \$/month.
- b 2.28 L/h to mL/min

**END OF TEST.**

**Use the back of this page  
for extra working space.**