

Time and Motion

Student Name: Solutions

Time Allowed: 20 Minutes

Total Marks: 26

PART A Calculators are NOT allowed in this section.

Question 1 (4 marks - 1, 1, 1, 1)

a) Convert the following times to those in brackets:

i) 0045 h (12 hr) 12:45 am ii) 2331 h (12 hr) 11:31 pm $\frac{1}{2}$ mark each.

b) Convert 2.75 hours to minutes, 2.75h = 2 hrs 45 min minutes

$120 + 45 = 165 \text{ mins}$

c) Calculate the elapsed time from 2:45 pm until 8:20 am the following day.

17 hrs 35 min ✓

d) What is the time $2\frac{3}{4}$ hrs before midday?

9:15 am ✓

Question 2 (3 marks - 1, 2)

a) Vanessa's flight lands in Singapore at 0840h. Her next flight leaves Singapore at 1820h. How long does Vanessa have to wait in the airport before she departs Singapore?

9 hrs and 40 min ✓

b) Peter wants to go for a bike ride which takes 52 minutes. He also wants to watch his favourite television show which starts at 7:35 p.m. What is the latest time that he can leave for his bike ride and be back in time to watch television?

6:43 pm ✓

$$52 - 35 = 17$$

$$7 \text{ pm} - 17 \text{ min}$$

OR

$$60 - 52 = 8$$

$$6:35 + 8 \text{ mins}$$

Question 3 (2 marks - 1,1)

Tom and Jerry competed against each other in a race. Tom completed the race in 0.75 hours while Jerry took 50 minutes.

a) Who won the race?

Tom ✓

b) Explain your answer

$$0.75 \text{ hrs} = 45 \text{ min}$$

Less than 50 min ✓

Question 4 (5 marks - 1, 1, 1, 2)

a) Convert this graphical scale into a ratio scale



Each bar on scale = 1 cm

1:200 000 ✓

b) 1 cm to 200 m can be written as 1: 20 000 ✓
 $\times 100 \text{ to convert}$

c) A map scale of 1 : 3000 means 1 cm on the map represents 30 ✓ metres in real life
 $\div 100 \text{ to convert}$

d) If the length of a room was 560cm and the floor plan scale was 1:80, how long would the line be drawn on the plan?

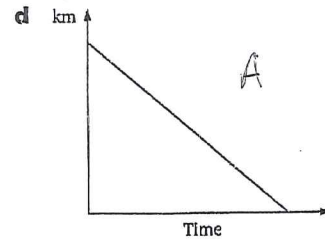
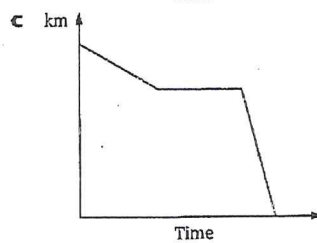
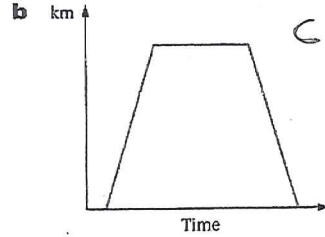
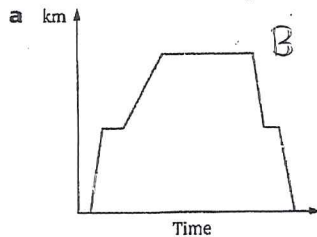
$$560 \div 80 \text{ ✓}$$

$$= 7 \text{ cm ✓}$$

must have pm if not only ✓

Question 5 (4 marks – 2, 2)

Match graph's a to d with the descriptions A to C below. For the graph that does not have a description write your own.

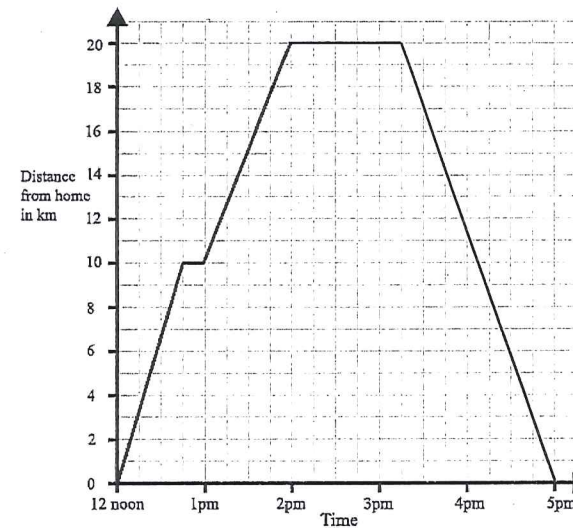


all correct ✓
one correct ✓
or two

- A. Brett stayed the night at his friend's house then he drove straight home in the morning.
- B. On his way to TAFE, Terry stopped at his work to pick up some tools. After he finished TAFE, he returned the tools to his work before he went home.
- C. After breakfast, Meshal drove to her friend's house. She stayed at her friends house for 2 hours and then she drove home.
- D. must mention returning ✓
must mention stopping ✓
-1 mark if story mentions going out and coming back
(as in graph b)

Question 6 (8 Marks – 1, 1, 2, 2, 1, 1)

The following graph shows the distance of a cyclist from his home



- a) For how long did he rest initially (for the first time)?

15 min ✓

- b) How far away from home was he at 1.30 pm?

15 km ✓

- a) What may have happened when he was 10 km from home before 1 pm? Explain.

He had to stop ✓

Any acceptable reason (fix a puncture, drink, admire the view, ask directions) ✓

- d) What was his 'average' speed for the entire bike ride?

$$40 \div 5 = 8 \text{ km/hr}$$

- e) i) How can you tell from the graph when the cyclist was travelling most quickly?

✓ When the line is steepest (accept steeper)

- ii) Between what times did this occur?

12 noon – 12:45 pm ✓



Mathematics Essentials 2018

Test 3 Unit 2

Task Weighting: 7%

Student Name: _____

Time allowed: 30 minutes

Total marks: 23

PART B Calculators and notes are allowed in this section.

Show all working where appropriate to maximise marks.

Question 7 (7 marks – 5, 2)

Three different families drove their cars from one town to another as they enjoyed their holidays. They used a map of the south-west region of Western Australia which has a scale of 1:750 000. Pairs of towns are listed in the table together with some actual distances. The weather conditions required them to travel at different speeds.

FAMILY NAME	SOUTH-WEST TOWNS	DISTANCE (km)	MAP DISTANCE (cm)	AVERAGE SPEED (km/h)	TIME TO TRAVEL (h)
Smith	Bunbury to Augusta	142	19	95	1.5 ✓
Brown	Walpole to Busselton	238	32 ✓	119 ✓	2
Jackson	Donnybrook to Bridgetown	56.25 ✓	7.5	93.75 ✓	0.6

a) Use your knowledge of distance, speed, time and scale to complete the table.
accept 93/94

b) One of the families broke a traffic rule. Which family broke the law? Explain your answer.

Brown family ✓

Maximum speed limit is 110 km/hr in W.A. ✓

Question 8 (6 Marks - 1, 1, 1, 3)

The actual straight line distance between Merredin and Southern Cross is 106km.

Using the map below calculate the following:

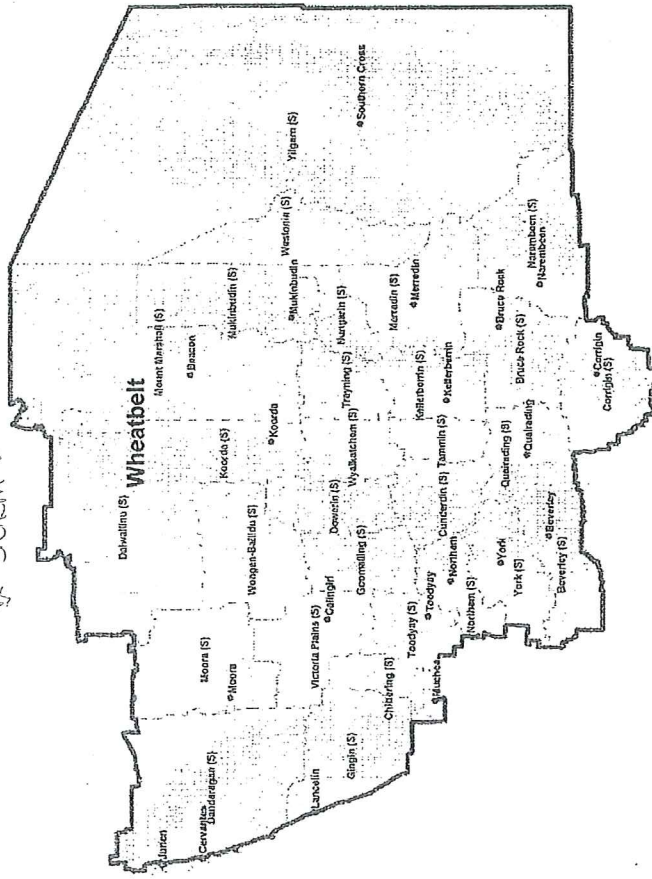
a) What actual distance would be represented by 1 mm on the map?

$$\begin{aligned} \text{Map Distance} &= 3.5 \text{ cm} \\ &= 35 \text{ mm} \\ 106 \div 35 &= 3.03 \text{ km (accept 3 km)} \end{aligned}$$

b) What actual distance would be represented by 1 cm on the map? Round your answer to the nearest km

$$1 \text{ cm} = 10 \text{ mm}$$

$$\begin{aligned} 3.03 \times 10 &= 30.3 \text{ km} \\ &\approx 30 \text{ km} \end{aligned}$$



c) Write the scale of the map based on your answer to part b).

$$\begin{aligned} 1 \text{ cm represents } 30 \text{ km} &= 1:300000 \\ &\text{must be ratio scale} \end{aligned}$$

d) Use your scale to calculate the distance between Moora and Koorda. Explain if your answer is reasonable.

$$\begin{aligned} \text{Map Distance} &= 4.8 \text{ cm} \\ 4.8 \times 30000 &= 144000 \text{ km} \\ (or) 4.8 \times 30 &= 144 \end{aligned}$$

ET-

The advertisement on the right is taken from a real estate agent's for sale listings.

- a) Using a scale of 1:2000, draw a diagram of the property for sale.

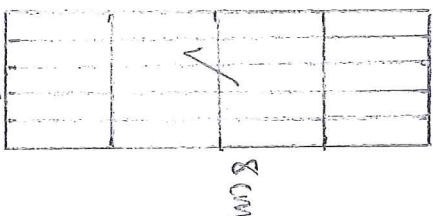
$$200 \cdot 105 = 21000 \checkmark$$

Block is 160mm 50m

$$= 16\,000\text{ cm} \times 5000\text{ cm} =$$

1920 1920

2.5 cm x 8 cm



- * Must be this orientation to match street frontage on advert.

b) If the property can be broken into individual blocks measuring $10\text{m} \times 40\text{m}$, show, using your diagram, the number of individual blocks that can be created.

The number of blocks is : 20 ✓

$$\frac{1}{0} \times \frac{f}{0} = \frac{f}{0}$$

$8000 \cdot 1 \cdot 100 = 20 \text{ blocks}$

5 across street frontage

4 down side of block,

- | - answer and digra
don't match.

1 mark - showing in diagram.

1
3000
of blocks

Sheila works for Ace Taxis

Ace Taxis uses three taxis: Alpha, Beta and Charlie

Sheila takes bookings from customers who want taxis.

Booking Sheet for Tuesday						
Customer	From	To	Pick up Time	Drop off time	Journey time (in minutes)	Taxi
School run	Grindley Street	Merton School	8:15	9:00	45	Alpha
School run	Marsh Bank	Merton School	8:15	9:00	45	Charlie
Miss Egan	Boston Road	Station	7:00	7:15	15	Alpha
Ms Green	Bank Street	Clinic	10:05	10:30	25	Beta
Mrs Adams	Copley Estate	Shopping Centre	9:25	9:45	20	Beta
Miss Crispi	Shopping Centre	Green Lane Estate	10:10	10:35	25	Alpha
Mr Smith	Copley Estate	Station	7:20	7:45	25	Charlie
Mr Mical	Rose Avenue	Shopping Centre	9:40	10:05	25	Charlie

Shelia makes a booking schedule to show which taxi will be sent to each customer.

She allows 15 minutes between dropping off one customer and picking up the next

Sheila has written four bookings on the booking schedule

Complete the booking sheet and the booking schedule to show which taxi will be sent to each customer.

Booking Schedule				
Taxis	7:00	8:00	9:00	10:00
Alpha	Miss Egan (7:00 – 7:15)	School run (8:15 – 9:00)		Miss Wispri (10:10 – 10:35)
Beta			Miss Adams (9:25 – 9:45)	Ms Green (10:05 – 10:30)
Charlie	Mr Smith (7:20 – 7:45)	School run (8:15 – 9:00)	Mr Neal (9:40 – 10:05)	

* Accept any correct answer that maintains 15 minute gap between bookings
End of Part B