



Student Name Marking Key

**Eastern Goldfields College
Mathematics Essentials U3&4 2017**

Test 1

Working Time: 55 minutes

Total Marks: 49 marks

Show all working where necessary to maximize your marks.

Part A – No notes or calculator allowed

Question 1

(5 marks: 1, 1, 2, 1)

- a) What is 15% of \$600

\$90 ✓

- b) Write the missing numbers in this sequence:

5, 10.5, 16, 21.5, 27. ✓

- c) i. What is the difference pattern in the table below?

-11 ✓

x	0	1	2	3	4	5
y	100	89	78	67	56	45

- ii. Describe a situation that this information might be related to.

-Value of an item and the number of years since it was purchased (or other reasonable answer). ✓

- d) A rule linking Cost (C) in \$ to the number of people (P) is given as follows:

$$C = 25P + 350$$

What could the 350 represent in this context?

-Cost of the venue (or other reasonable answer) ✓

Question 2

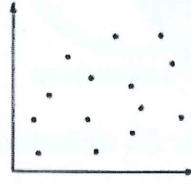
(3 marks: 1, 2)

- a) Given the four scatter graphs below, which one shows the weakest linear relationship?

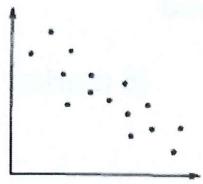
A



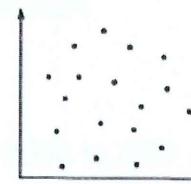
B



C



D



- b) Match each of the scatter graphs with one of these descriptions:

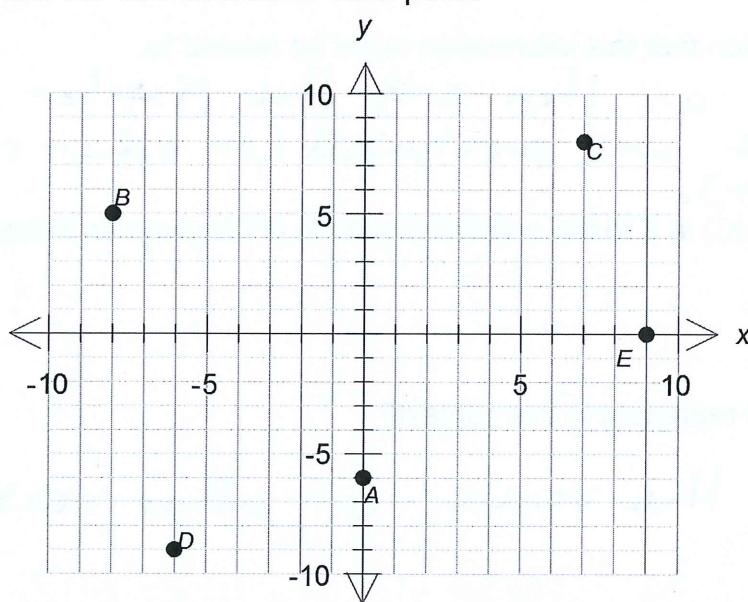
- i. Sales of flyspray and the temperature
- ii. Frequency of playing sport and fitness level
- iii. Foot length and intelligence
- iv. Test results and hours spent watching TV

Graph B $\frac{1}{2}$
 Graph A $\frac{1}{2}$
 Graph D $\frac{1}{2}$
 Graph C $\frac{1}{2}$

Question 3

(5 marks)

State the coordinates of each point.



- A $(0, -6)$ ✓
- B $(-8, 5)$ ✓
- C $(7, 8)$ ✓
- D $(-6, -9)$ ✓
- E $(9, 0)$ ✓

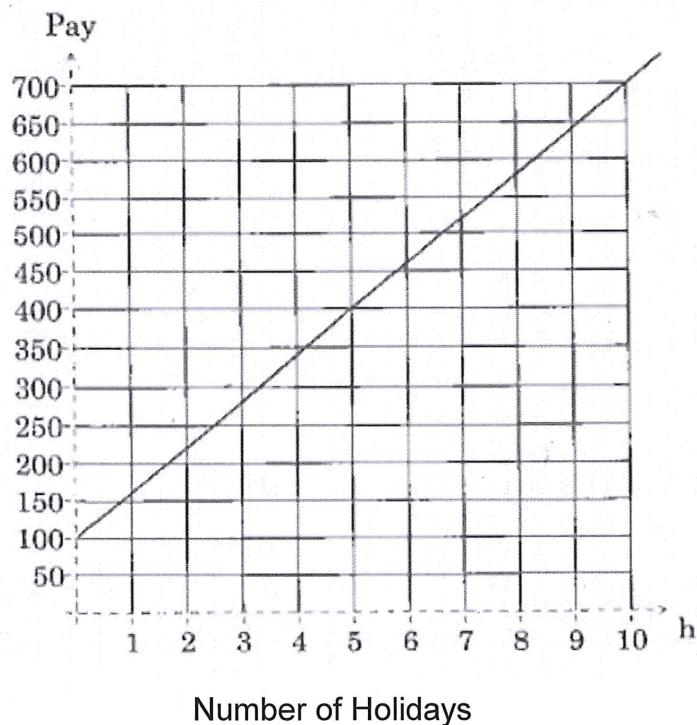
-1 for no brackets.

Part B – Notes page and calculator permitted for this section

Question 4

(7 marks: 2, 1, 2, 2)

Shane is paid a retainer (fixed amount when no sales are made) and a commission on the value of his sales. His work involves getting people to sign up for holidays.



- a) What is his retainer and what feature of the graph indicates this?

\$100 - The vertical intercept ✓

- b) How much does he earn for 10 contracts?

\$700 ✓

- c) What is the gradient of the line and what does this represent in the context of this situation?

60 - It is \$60 per holiday
that Shane is paid. ✓

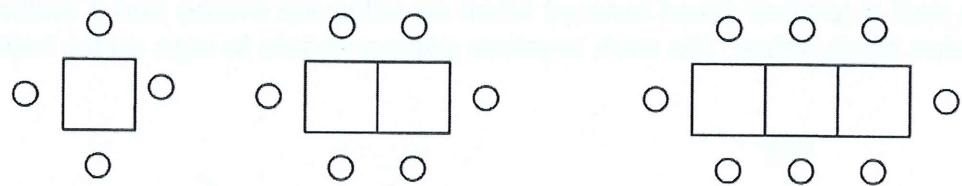
- d) What is the rule in terms of 'h' to calculate Shane's pay (P)?

$$P = 60h + 100$$

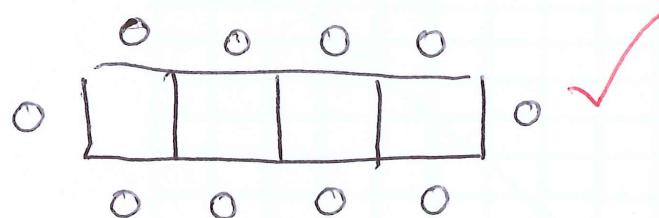
✓ ✓

Question 5**(5 marks: 1, 1, 2, 1)**

The diagrams below represent an arrangement of tables and chairs.
This is summarized in the table below.



a) Draw the next diagram in the pattern.



b) Complete the table for values for $t = 3$ and $t = 4$.

Number of tables (t)	1	2	3	4	5	10	20	100
Number of chairs (n)	4	6	8	10	12	14	16	18

c) Write a rule linking t and n

$$n = 2t + 2$$

d) Complete the table above



Question 6

(11 marks: 3, 1, 1, 2, 1, 2, 1)

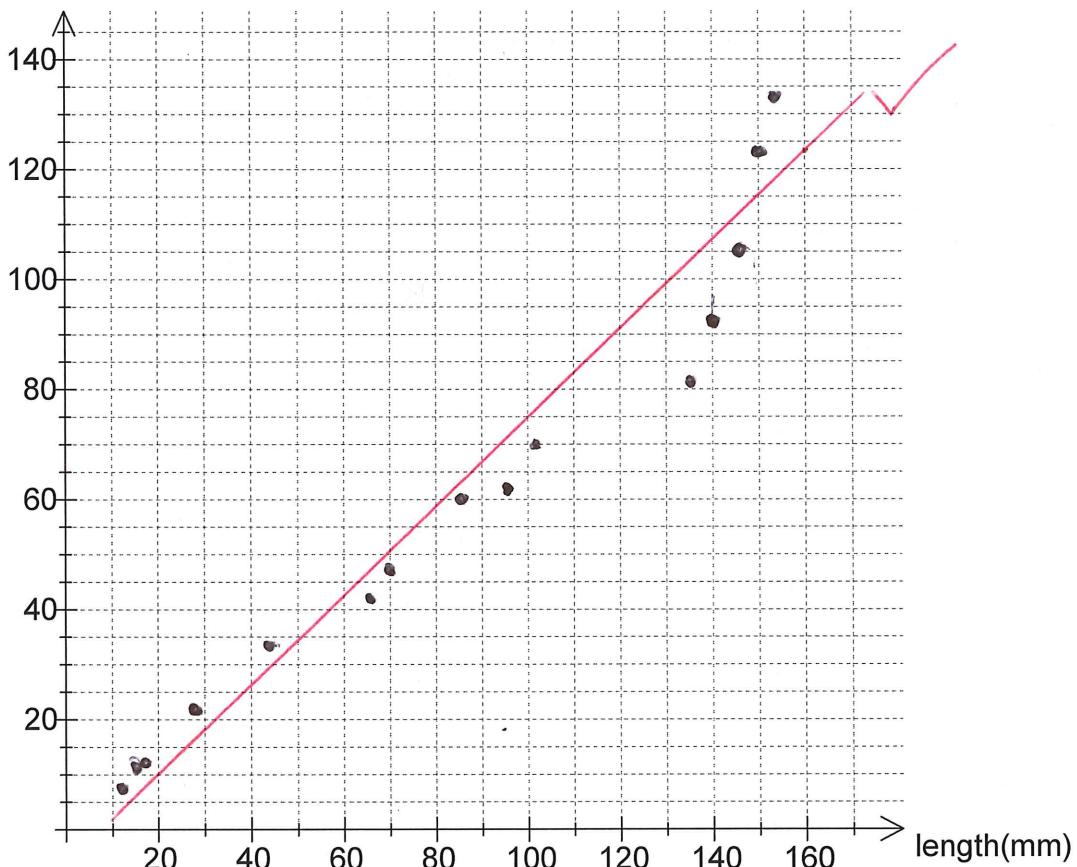
The table below shows the length and diameter of a small sample of bird eggs from different species of birds.

length (mm)	95	18	29	70	66	11	86	101	15	135	43	147	150	153	140
diameter (mm)	62	13	21	47	42	8	60	70	13	81	34	110	124	133	89

- a) Construct a scatterplot for the data.

✓✓✓ -1 if axes swapped
-1 for each point out.

diameter(mm)



- b) State the dependent and independent variables;

Dependent : Diameter

Independent : Length ✓

- c) Describe the relationship between length and diameter for the dataset.

Pos As Positive Correlation. ✓
Moderate + linear

- d) Draw a line of best fit and use it to predict the diameter of an egg with a length of 50 mm

~35mm - According to their L.B.F ✓

- e) Predict the diameter of an egg with a length of 160 mm.

$\sim 124 \text{ mm}$

- f) Which answer is likely to be more reliable/accurate – (d) or (e)? Explain why.

(d) ✓ because it uses interpolation ✓ rather than extrapolation.

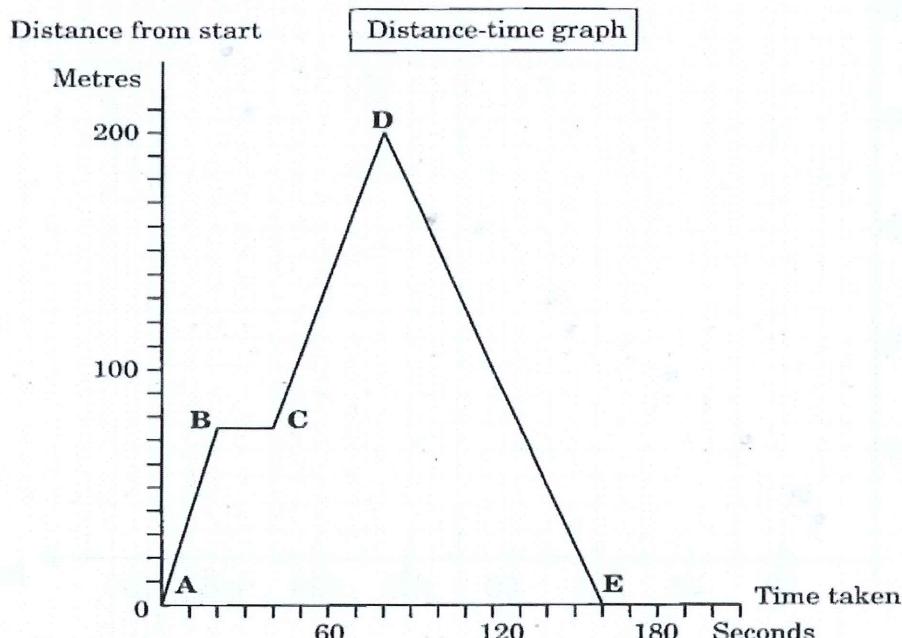
- g) Describe the trend of the data.

Increasing ✓

Question 7

(2 marks)

The following graph shows the motion of a runner on a path.



Which of the following statements is **false** and why?

- a) The runner fell over.

- b) The runner ran up a hill and down the other side. ✓

- c) The runner's fastest speed was indicated by the part of the graph marked AB.

- d) The runner's average speed was the same as the speed indicated by the part of the graph marked DE.

Reason: The section DE indicates they returned to their starting point. ✓

(7) 22, 1, 2)
 (6 marks: 1, 1, 2, 1, 1)

Question 8

Mike, the plumber charges a \$40 callout fee then \$60 per hour. Alice's Plumbing does not charge a callout fee but charges \$80 per hour.

- a) Complete the tables to show the costs over the first 5 hours:

Mike

No. of hours	0	1	2	3	4	5
Cost	40	100	160	220	280	340

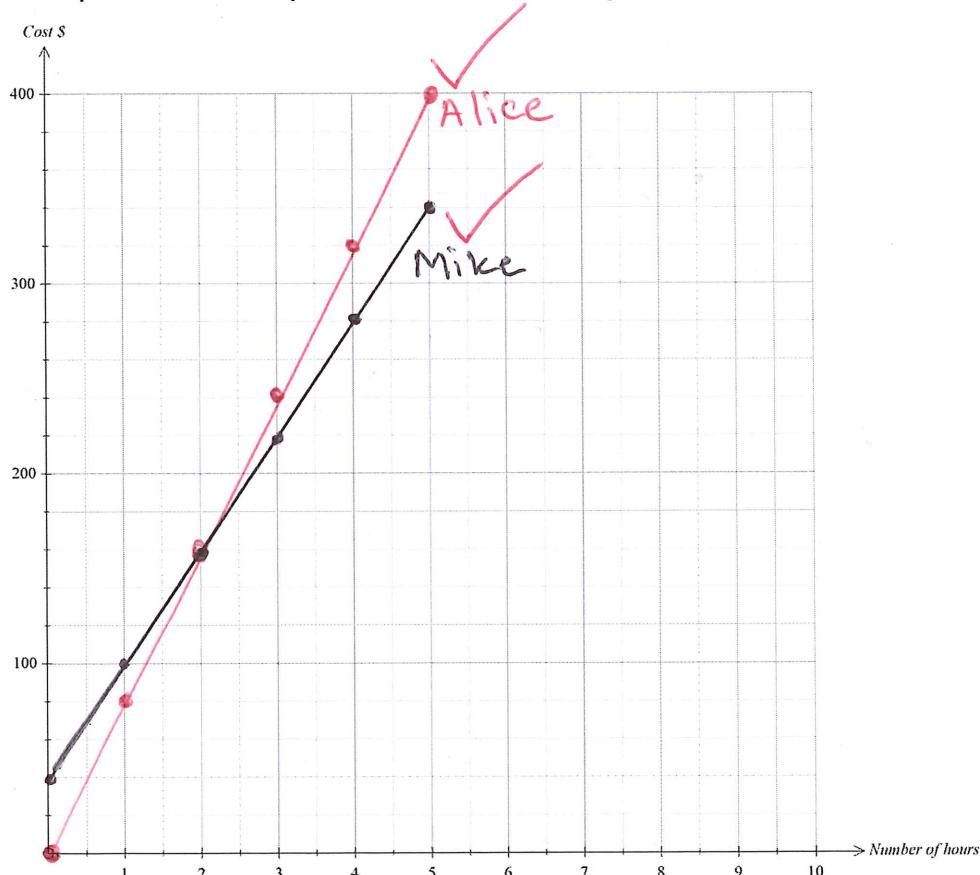


Alice

No. of hours	0	1	2	3	4	5
Cost	0	80	160	240	320	400



- b) Graph each of the plumbers' fees on the grid below.



- c) Which plumber would be cheaper if you had a job that lasted 10 hours?

Mike. ✓

- d) Determine the co-ordinates of the intersection of the two graphs and comment on its significance in the context of this situation.

(2, 160) - Before this point Alice is cheaper

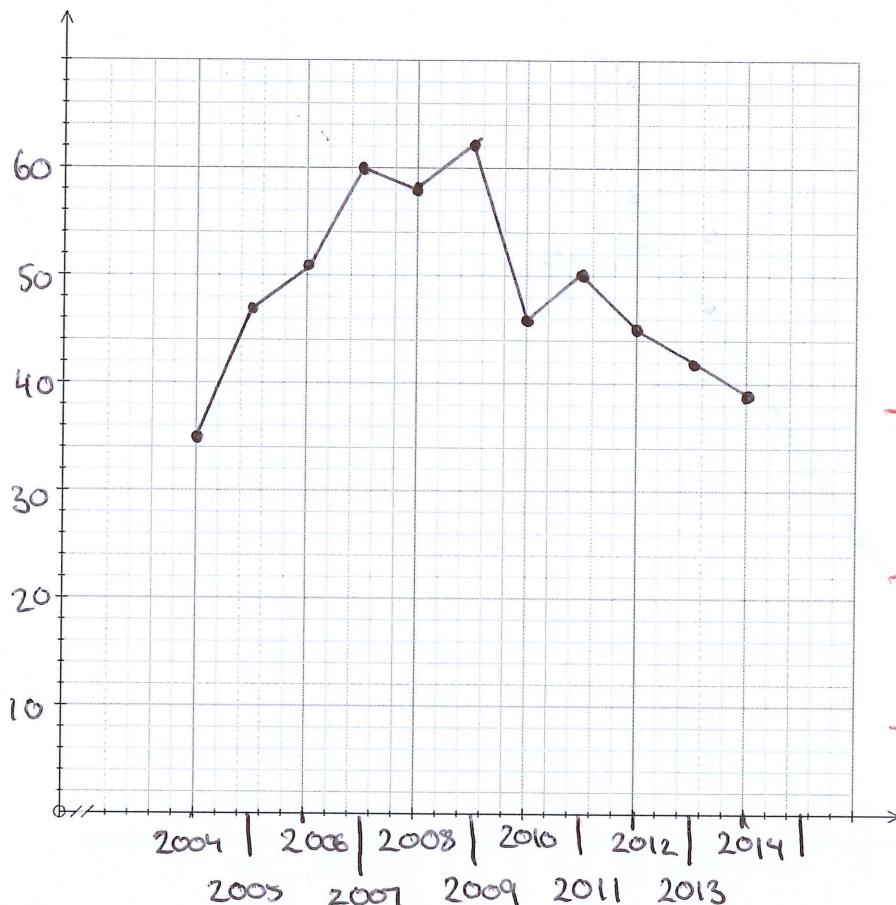
- Length of a job for which after this point Mike is cheaper
 Mike and Alice charge the same

Question 9**(5 marks: 3, 2)**

The number of babies born each year in Kojonup District Hospital is as follows:

Year	Number of babies
2004	35
2005	47
2006	51
2007	60
2008	58
2009	62
2010	46
2011	50
2012	45
2013	42
2014	39

- a) Graph the data as a line graph on the grid provided below.



- ✓✓✓
- 1 if dots are not joined
 - 1 for every wrong point
 - 1 for incorrect scale.

- b) What comment can you make about the trend in the birth rate in this town?

Births peaked in 2009, but have had a decreasing trend since then. ✓✓

END OF TEST