Name: _____ Teacher :		Date: _____
Baldivis Secondary College	**Year 12 Essentials** **Linear Equations 1** **Full working out MUST be shown to get full marks for each question.**	/37
Total Time:	45 minutes	
Weighting:	5%	
Equipment:	Pen, pencil, ruler, scientific calculator, 1 sided A4 page of notes	

Three electricians, Mr. Hothouse, Mr. Summer and Mr. Seawater, all work in the same town. The locals needing repairs often compare their prices. Customers pay for the time the repairmen take to do the job. The cost of parts is charged separately.

1. Mr. Hothouse (2.5+2.5+1+1+2= 9 marks)

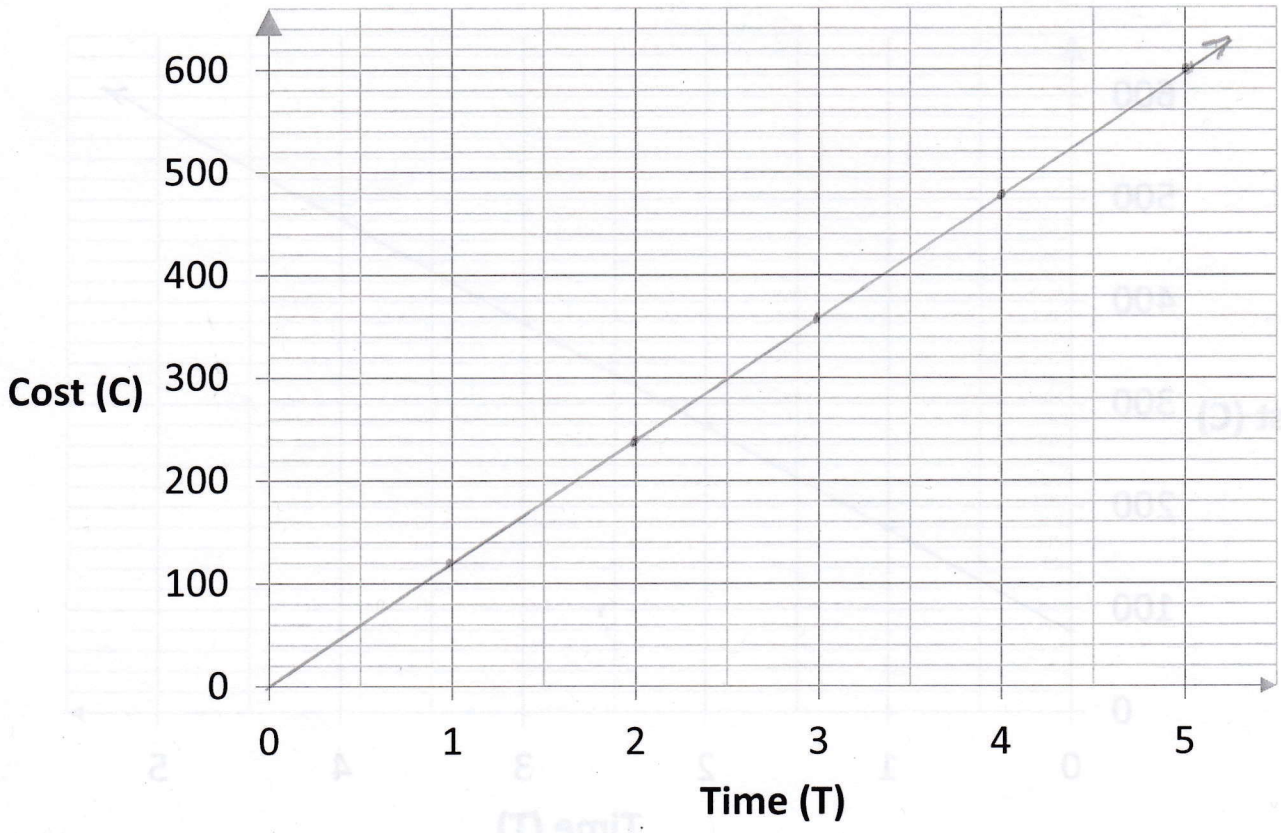
Mr. Hothouse simply charges $120 per hour for his services.

(a) Complete the table showing his charges:

Time (in hours)	1	2	3	4	5
Cost (in dollars)	$120	$240	$360	$480	$600

2.5

(b) Plot the values on the axes below. Join the points up to make a line:



2.5

(c) What would Mr. Hothouse charge if he were with a customer for 2 hours and 30 minutes?

2.5×120

$= \$300$ (1)

(d) What would Mr. Hothouse charge if he repaired a customer's air conditioner in just 45 minutes with a new part costing \$95?

$\frac{45}{60} = \frac{3}{4}$ hr Labour $= \frac{3}{4} \times 120$

$= \$90$

Total $= 90 + 95$

$= \$185$ (1)

(e) What is the equation of the line you have drawn?

$C = 120T$ (2)

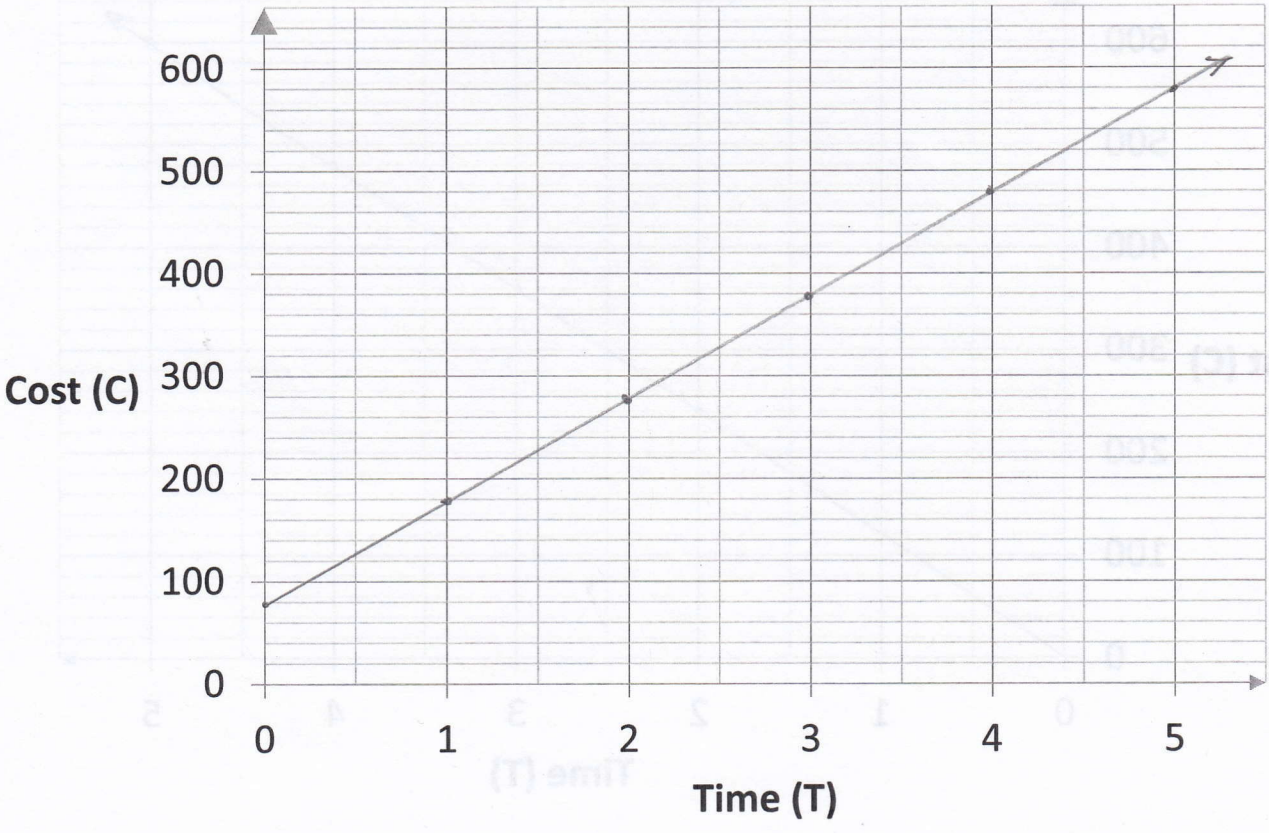
2. Mr. Summer (2.5+2.5+1+2+2 +1+1= 12 marks)

(a) Mr. Summer took a different approach. He decided that the customers should pay a call out fee, called a standing charge, of \$80 just for arriving at the customer's house. Then he would charge \$100 per hour for his work. Complete the table to show his charges:

Time (in hours)	0	1	2	3	4	5
Cost (in dollars)	\$80	\$180	\$280	\$380	\$480	\$580

(2.5)

(b) Now plot the values on the axes below. Join them up to make a line.



(c) What does Mr. Summer charge for a job that takes 1 hour and 15 minutes?

$80 + 1.25 \times 100$

$= \$205$ (1)

(d) Mr. Summer had a part in his van for the next customer. He charged $45 for it. He spent 45 minutes at the house altogether. How much was the customer's bill?

$80 + 0.75 \times 100 + 45$

$= 80 + 75 + 45$

$= \$200$ (2)

(e) What is the equation of the line that you have drawn?

$C = 100T + 80$ (2)

(f) What part of the charges is the vertical intercept?

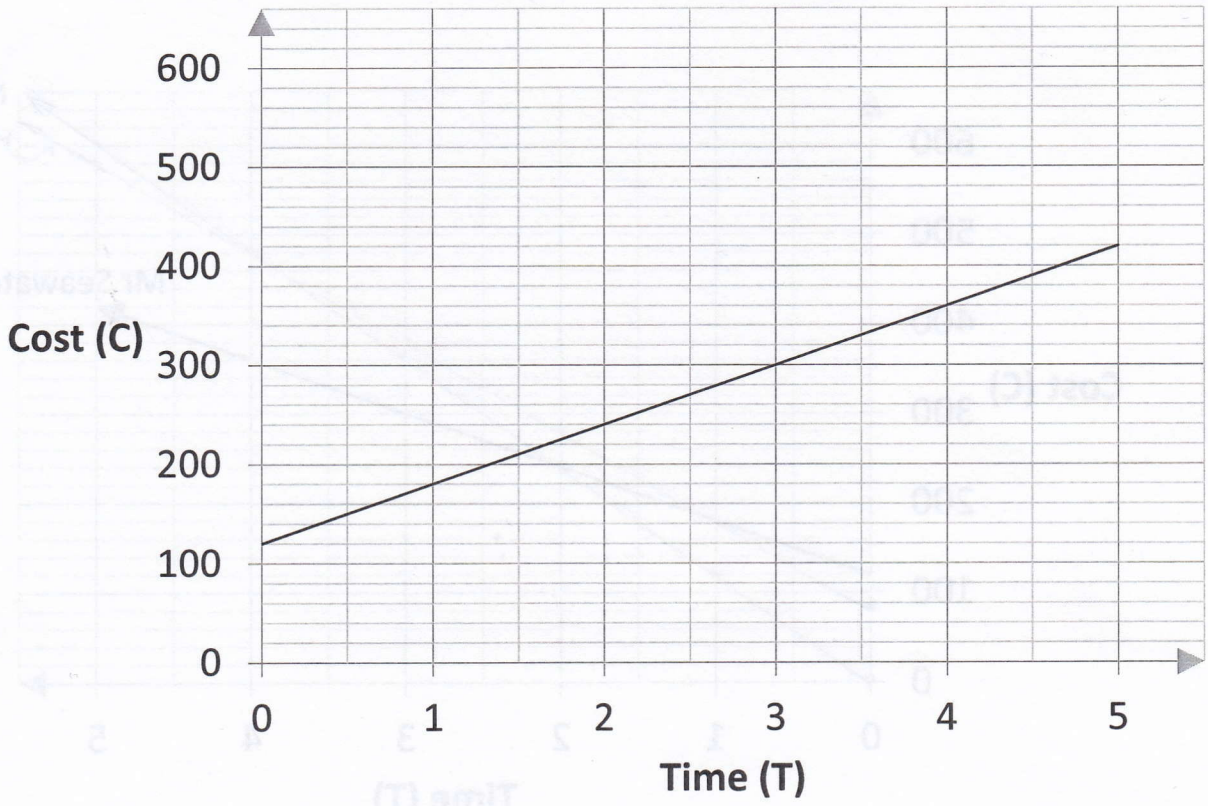
The standing charge - $80 (1)

(g) What part of the charges is the constant rate of change?

The hourly rate - $100 (1)

3. Mr. Seawater (2+1+1+1+1= 6 marks)

Mr. Seawater has another set of charges for his customers, which can be seen on the graph below.



(a) What is the vertical intercept of this line? What is the constant rate of change?

Vertical Intercept is 120

Constant rate of change is 60 (2)

(b) What does Mr. Seawater charge as his callout fee?

$120 (1)

(c) What does he charge per hour?

$60 (1)

(d) What is the equation of the line that represents Mr. Seawater's charges?

$C = 60T + 120$ (1)

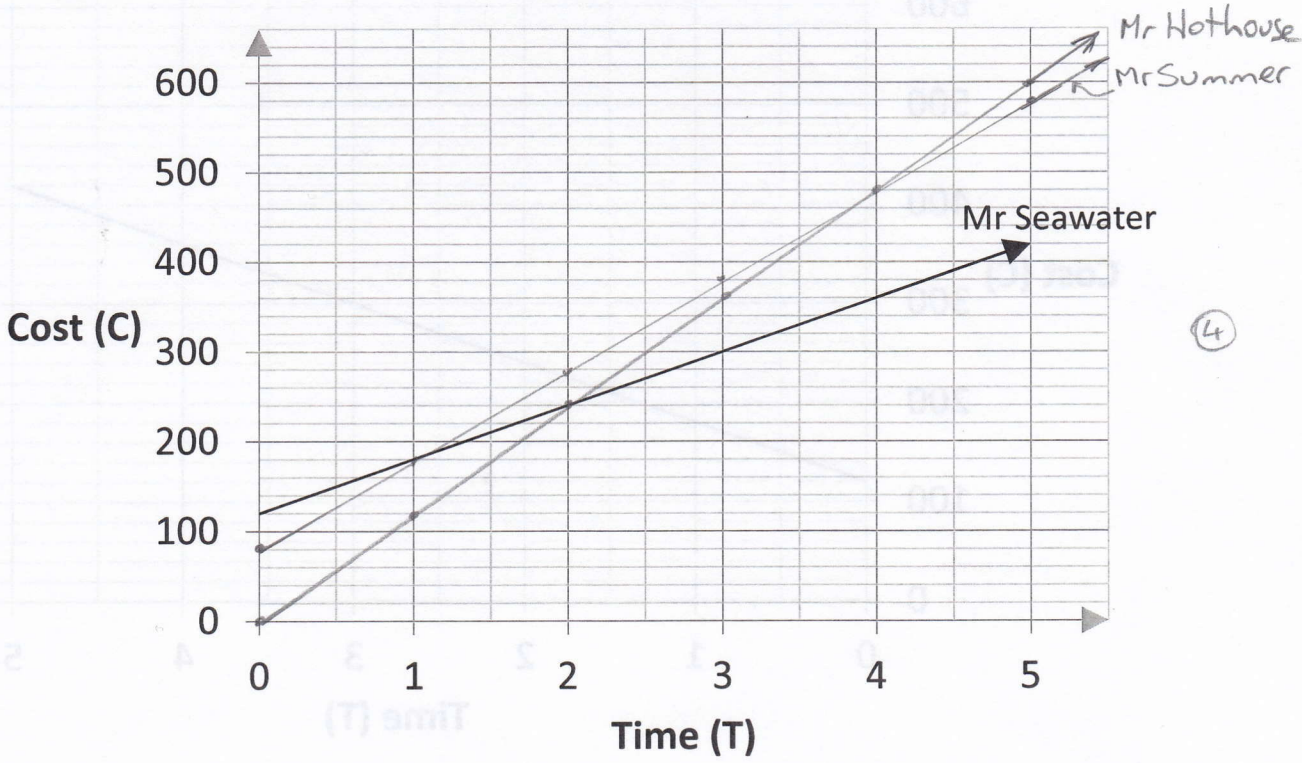
(e) What would Mr. Seawater charge if it were a quick repair, only taking half an hour?

$60 \times 0.5 + 120$

$= \$150$

4. <u>Comparing all three</u> (4+2+1+1+2 = 10 Marks)

One customer decided to analyse all three repairmen to help him choose the best one. Help him by putting all three lines drawn earlier into the same axes and label them. Mr. Seawater's has been done for you.



(4)

a) If the customer knew it was only going to be a 1.5 hr job, which repairman would he use? Why?

Mr Hothouse
because he is the cheapest for that time. (2)

b) At what time does this repairman stop being the cheapest?

2 hours (1)

c) Which repairman would he then choose?

Mr Seawater (1)

d) Which repairman would he never choose? Why?

Mr Summer
because there is always a cheaper option (2)

End of Test