



Year 11 Mathematics Applications (AEMAA)  
Test 3 Semester 2 2021

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

Teacher: Day Friday Hill Kelly Loh Staffe

***CALCULATOR ASSUMED***

**Materials allowed:** One A4 page of notes (both sides), calculator(s),  
Formula sheet  
Show full working to obtain full marks for each of the questions in this section.

CF	/24
CA	/40
Units Deduction	
Total	/64

**Time: 35 minutes**

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**Question 6 [8 marks: 4,4]**

For the following situations: define an unknown variable, write an equation, and then solve the problem.

a) The length of a rectangle is three times the width of the rectangle, and the perimeter is 48cm.  
Determine the area of the rectangle.

b) Joshua is six years older than his sister Peta. Four years ago, Joshua was twice her age. How old is Joshua now?

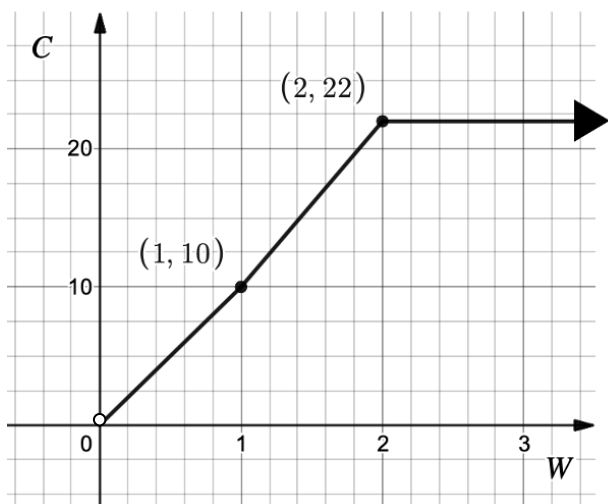
**Question 7 [4 marks]**

For the following situation: define two unknown variables, write a pair of equations, and then solve the problem.

An Uber fare is made up of an initial fixed cost known as the flag-fall and a charge per kilometre travelled. Trevor travelled 8km by taxi to his friend's place for a cost of \$18.50. Later that day he travelled 12km from his friend's place to the airport at a cost of \$26.50. Determine the flag-fall and the cost per kilometre.

**Question 8 [10 marks: 4, 3, 3]**

Pamela is looking to send a number of parcels to the Northern Territory from Perth. One option is to use a private postal company, ZoTracking. The rates for ZoTracking are shown in the piece-wise function below.



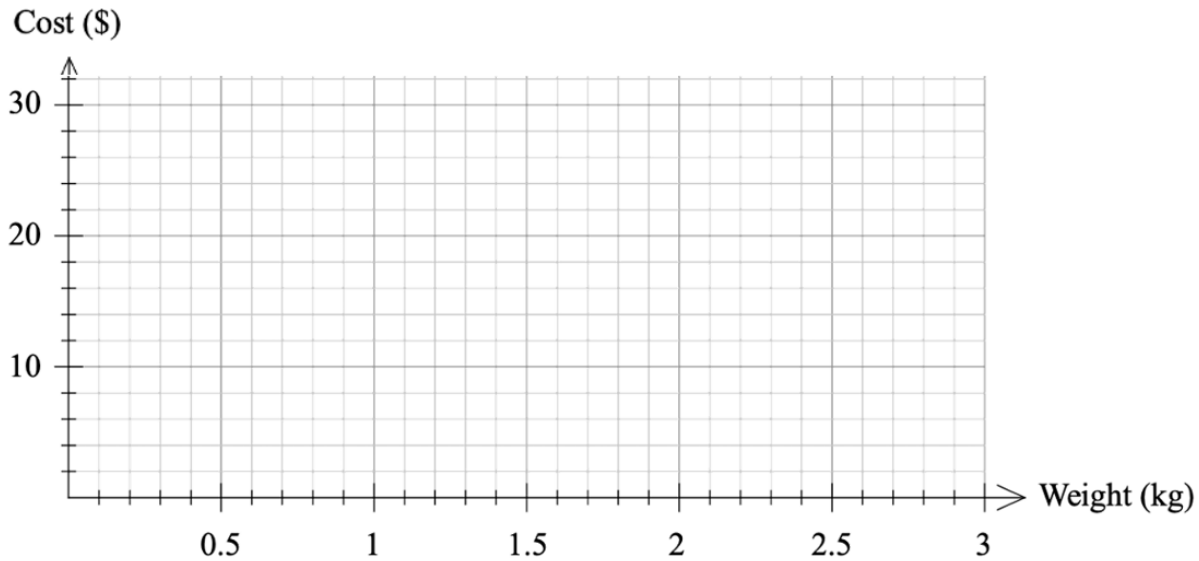
a) Complete the piece-wise function that describes the Cost,  $C$  dollars, of sending a parcel weighing  $W$  kg with ZoTracking.

$$C = \begin{cases} 10W, & 0 < W \leq 1 \\ \underline{\hspace{2cm}}, & \underline{\hspace{2cm}} \\ \underline{\hspace{2cm}}, & \underline{\hspace{2cm}} \end{cases}$$

The postage costs, using another company, ExpressBlue, are shown in the following table.

Weight of Parcel (W kg)	Cost (\$C)
$0 < W \leq 0.5$	5
$0.5 < W \leq 1$	8
$1 < W \leq 2$	16
$2 < W \leq 2.5$	22
$W > 2.5$	24

b) Represent this information in a step graph.



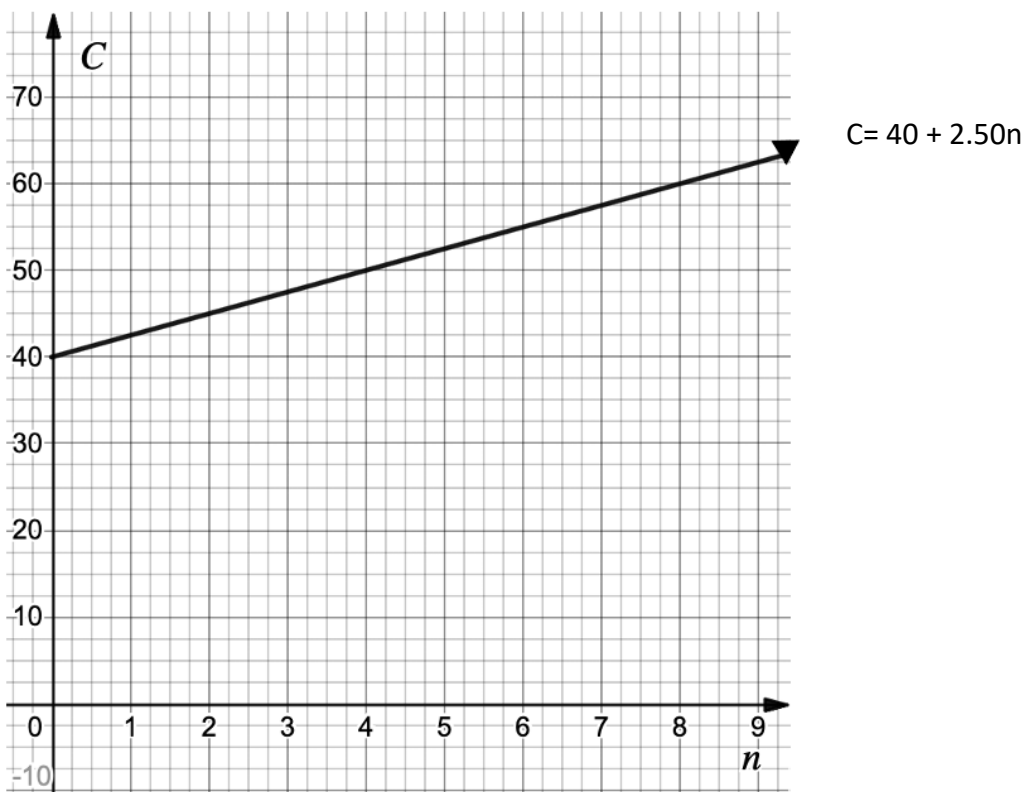
c) Pamela has two parcels to post to the Northern Territory, one to Alice Springs and the other to Darwin. One parcel weighs 750g and the other weighs 2.5kg. Provide a recommendation on which postal company Pamela should use. Justify your answer.

**Question 9 [9 marks: 1, 2, 3, 3]**

Yolanda sells handmade bracelets at a market for \$12.50.

a) Determine the equation to represent the revenue,  $R$ , for selling  $n$  bracelets.

b) The cost to make  $n$  bracelets is represented by the equation  $C = 40 + 2.50n$ , as plotted below. Plot the equation,  $R$ , on the same axes.



c) Using the graph, determine the point of intersection. In the context of this problem, interpret your solution.

d) If Yolanda sells 13 bracelets, calculate the profit or loss she makes. Justify your answer with evidence.

**Question 10 [9 marks: 3, 2, 2, 2]**

A large fish tank is being filled with water. After 2 minutes the height of the water is 3 cm and after 5 minutes the height of the water is 4.5 cm. The height of the water,  $h$ , in centimetres after  $t$  minutes can be modelled by a linear relationship.

a) Determine the equation to represent the height of the water,  $h$ , after  $t$  minutes.

b) In the context of this problem, what does the gradient represent?

c) Determine how long it takes for the water to reach 6 centimetres.

d) Was the fish tank empty of water before the filling of the tank started? Justify your answer.

**END OF TEST**