

## Year 8 Coordinate Geometry Assignment

### Choosing the Right Hire Car

A group of tourists have just arrived at Sydney airport and are investigating the best hire car deals. They decide to study the different options offered by Bonza Car Rentals.

The group know that on their first day they will be visiting the local attractions close to Sydney, so they will not be travelling many kilometres.

#### Car Deals on Offer:

Option 1: \$60 per day – unlimited kilometres.

Option 2: \$30 per day - \$0.25 per kilometre.

Option 3: \$40 per day - \$0.35 for every kilometre over 100km.

1. Calculate the cost of each option if the total distance the group travelled in a day was 90km.

a. Option 1 \$60

b. Option 2  $0.25 \times 90 = 22.5 + 30 = \$52.50$

c. Option 3 \$40

2. Write an equation to show the cost of hiring a car for **option 1** and **option 2**. Use **C** to represent the total cost of hiring a car for a day, and **x** to represent the number of kilometres travelled in a day.

a. Option 1  $C = 60$

b. Option 2  $C = 30 + 0.25x$

3. Using the equations you constructed in question 2, plot the graphs of the three options on the set of axes provided to show the **cost of hiring a car for a day to travel 200km**. Use different colours to represent each option.

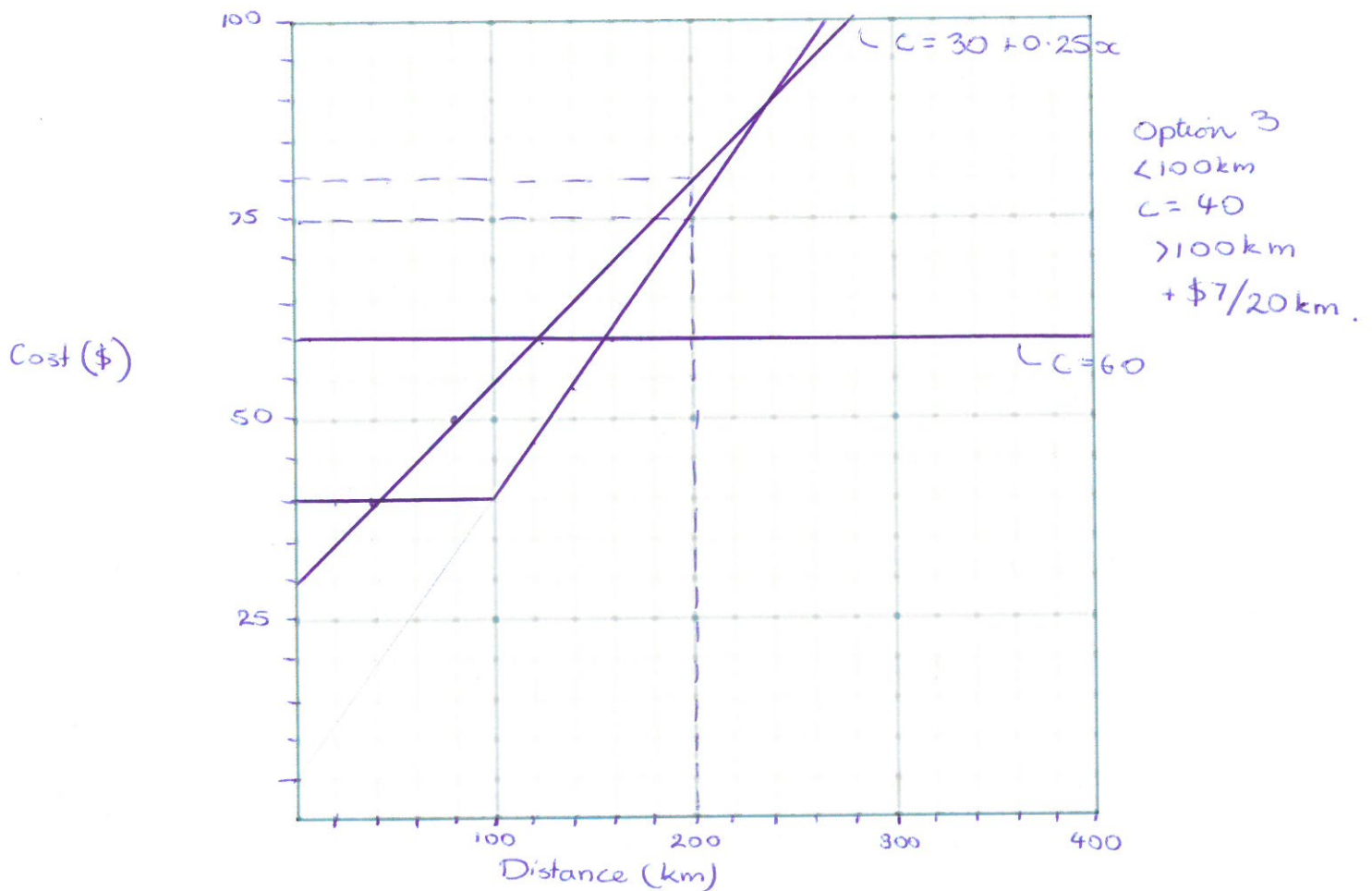
Remember to include:

- A title
- Axes labels (x-axis: distance, y-axis: cost) and appropriate units
- X-axis should end at 300km.
- Y-axis should end at \$100

Option 1  $C = 60$

Option 2  $C = 30 + 0.25x$

x	40	80			
C	40	50			



4. Using the equations you plotted in the graph, **explain** the total costs of each hire option.

a. Option 1

Constant cost as it is a flat rate per day.

b. Option 2

Costs more the further you drive.

c. Option 3

Cheap for short distances, but increases sharply after 100km.

5. Using your graph, **calculate** the cost of travelling 200km in one day with each option.

a. Option 1

\$60

b. Option 2

~~\$75~~  
\$80

c. Option 3

\$75

The group decide to drive from Sydney to Melbourne. They estimate the trip will take 2 days. (936km one way)

On the way they will stop overnight in Canberra.

They plan to spend 4 days in Melbourne. (Total distance travelled = 180km)

They plan to drive back to Sydney in 1 day and return the car to Bonza Car Rentals.

6. **Calculate** the number of days the group will require their car.

$$2 + 4 + 1 = 7 \text{ days}$$

7. **Calculate** the total distance of their trip.

$$936 + 180 + 936 = 2,052$$

8. **Calculate** the cost of this trip for each rental option.

a. Option 1

$$7 \times 60 = \underline{\$420}$$

b. Option 2

$$\begin{aligned} C &= 30 + 0.25x \\ &= 30 + 0.25 \times 2052 \\ &= \underline{\$543} \end{aligned}$$

$$\begin{aligned} 2052 \text{ km} \\ - 100 \\ = 1952 \end{aligned}$$

c. Option 3

$$\text{Slope} = 5 + 0.35x$$

$$\begin{aligned} C &= 5 + 0.35 \times 1952 \\ &= \underline{\underline{\$688}} \end{aligned}$$

9. The group decided to take hire option 1. **Explain** whether this was the best deal or not. Use your calculations from question 8 to **justify** your answer.

Option 1 works out to be the cheapest for the Melbourne trip @ \$420. Option 2 costs \$543 and Option 3 costs \$688.

Option 3 would be cheapest for trips under 110km

Option 2 would be cheapest for trips under 20km.