



Linear models

Year 11
Mathematical Methods

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Learning Objectives

By the end of the lesson, I hope that you understand and can apply the following to a range of questions from the Year 11 Mathematical Methods course.

- To be able to apply the knowledge from previous lessons to real world models relating to linear relationships



RECAP

The previous lessons have looked at the interesting topic of reviewing coordinate geometry. We have looked at:

- Distance and midpoints
- The gradient of a straight line
- The equation of a straight line
- Graphing straight lines
- Parallel and perpendicular lines
- Families of straight lines

This lesson is going to apply the learnings to something a little more real world.

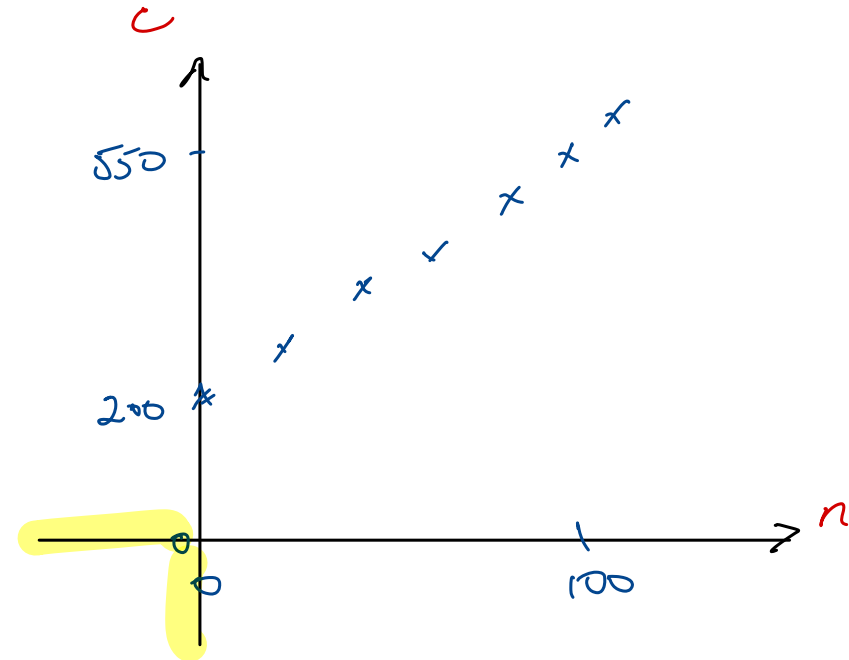


Example 1

A historical site charges a tour company for priority entrance to the site. The charge consists of a monthly fee of \$200 plus \$3.50 for each tourist brought to the site. Construct a cost function that describes the monthly charge and sketch the linear graph for this.

n = num of
tourists

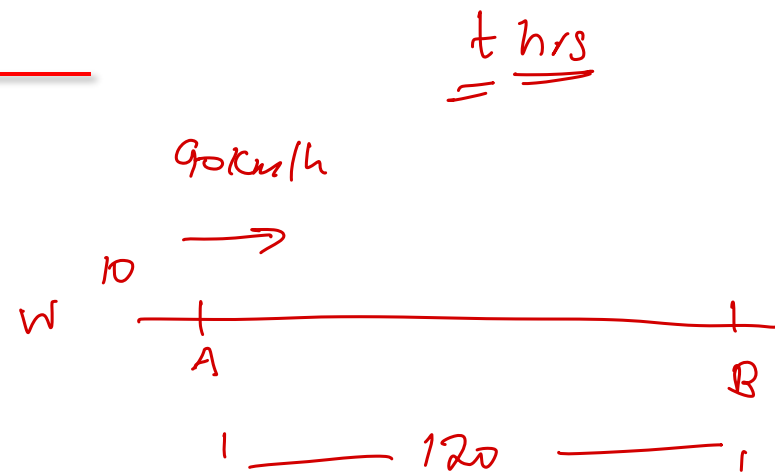
$$\begin{aligned} C &= 200 + 3.5n \\ &= 3.5n + 200 \end{aligned}$$



Example 2

A car starts from point A on a highway 10 kilometres past the Wangaratta post office. The car travels at a constant speed of 90 km/h towards picnic stop B, which is 120 kilometres further on from A. Let t hours be the time after the car leaves point A.

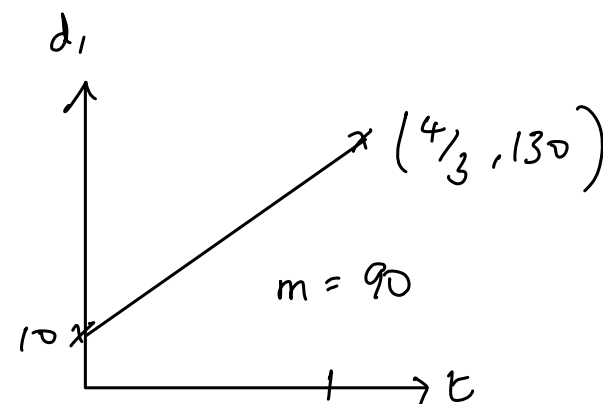
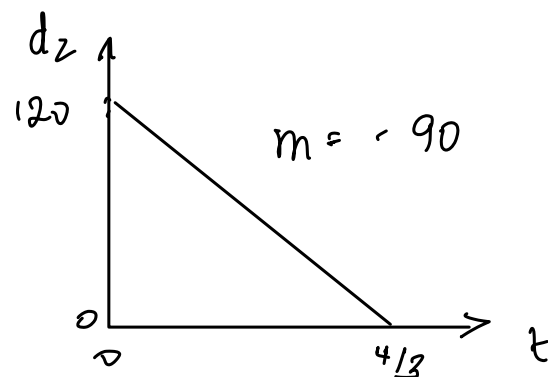
- Find an expression for the distance d_1 of the car from the post office at time t hours.
- Find an expression for the distance d_2 of the car from point B at time t hours.
- On separate sets of axes, sketch the graphs of d_1 against t and d_2 against t and state the gradient of each graph.



$$y = c + mx$$

$$a. \quad d_1 = 10 + 90t$$

$$b. \quad d_2 = 120 - 90t$$



$$\frac{120}{90} = \frac{4}{3}$$



Learning Objectives: Revisited

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