Constant rates of change

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.

- Understand what a rate of change means
- Understand what a constant rate of change means
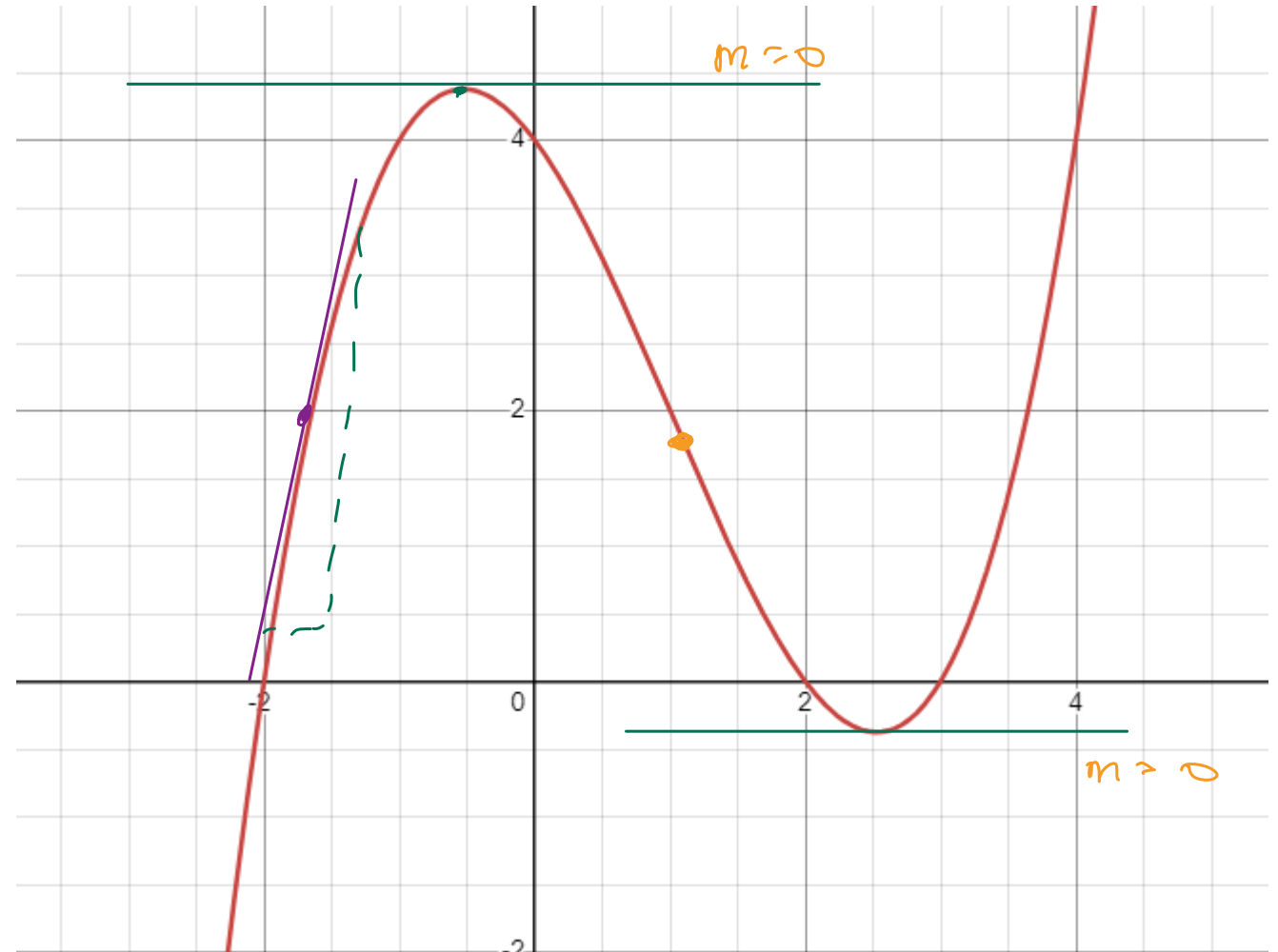
RECAP

In the previous lesson we looked at the idea of rates of change. In the questions we looked at there were variable rates of change. These are great but lets look at making it simpler when we have constant rates of change.

It's going to be important to remember how to find the gradient between two points too!

$$gradient = \frac{rise}{run}$$

$$gradient = \frac{y_2 - y_1}{x_2 - x_1}$$

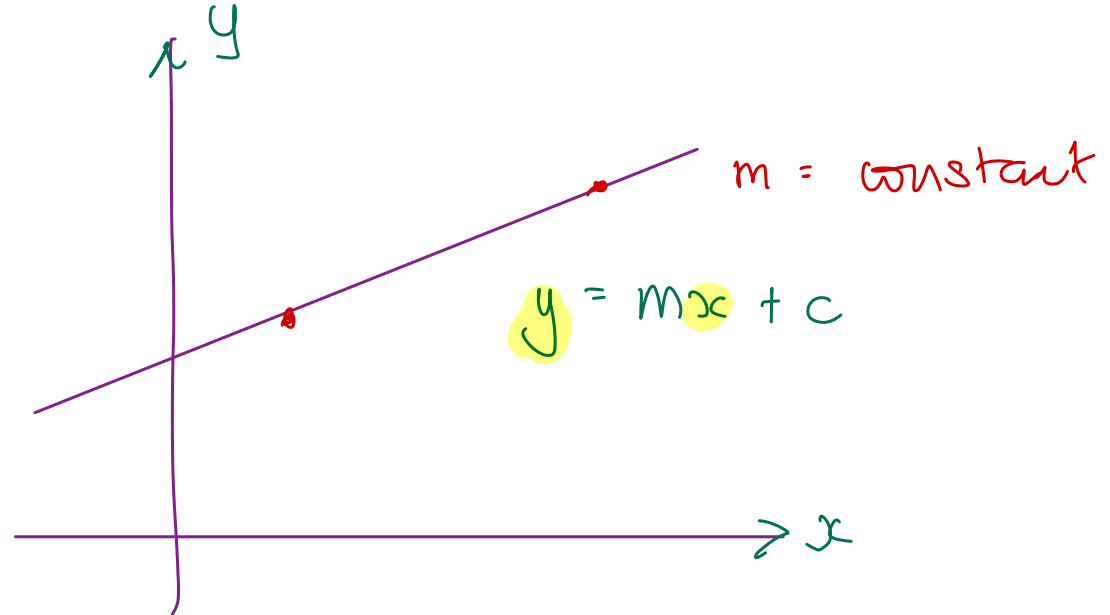$$\frac{1}{3}(x-2)(x+2)(x-3)$$

$m = 0$

$m = 0$

Constant rate of change

Constant means straight line. A linear function will have a
constant rate of change.

It's going to make sense, from now on, to think of a rate of
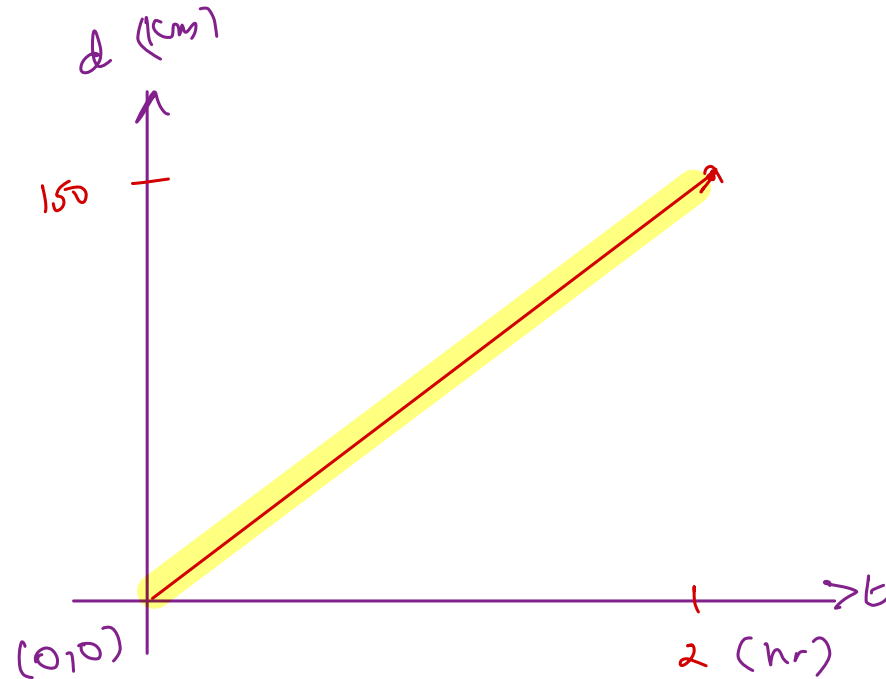change as a gradient between two points.

We can find the equation of a straight line using the Year 9
Maths:

$$y = mx + c$$

Question 1

A car travels from Copahunga to Charlegum, which is a distance of 150 km, in 2 hours (120 minutes). Assuming the car travels at a constant speed, draw a distance–time graph and calculate the speed.

$$S = \frac{D}{t} \quad \frac{y \quad \text{rise}}{x \quad \text{run}}$$

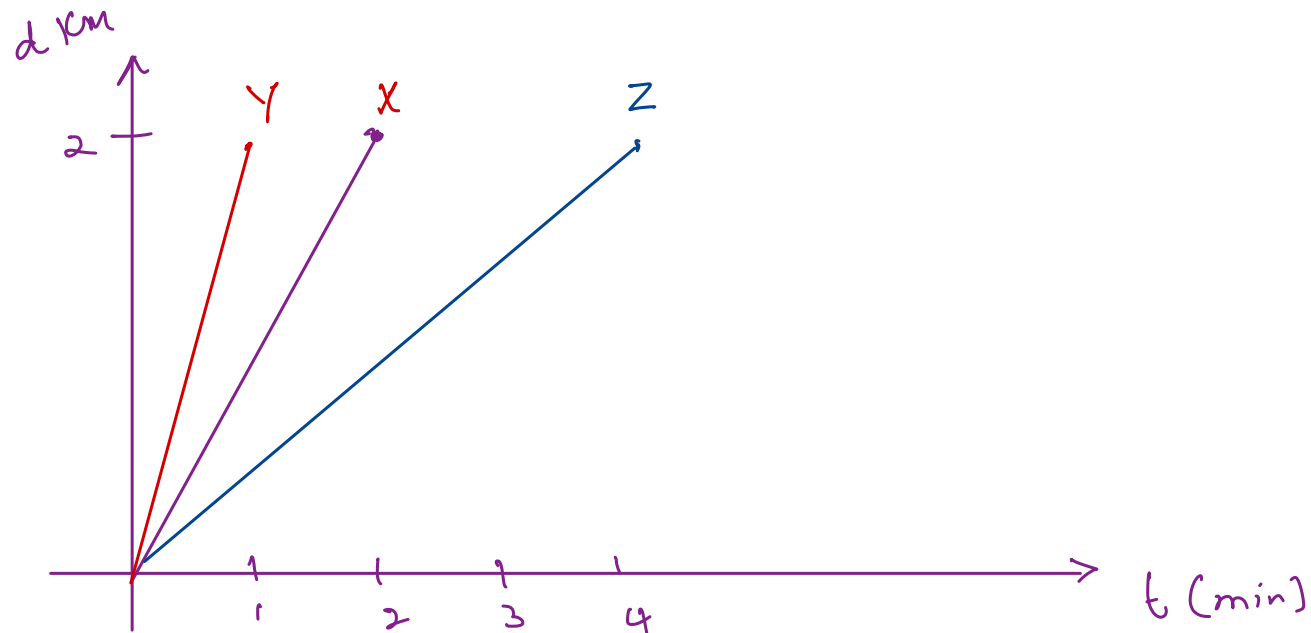$$S = \frac{150}{2} = 75 \text{ km/hr}$$

Question 2

Three cars are driven over a 2-kilometre straight track. They are all to go from point A to point B. Each car travels with constant speed. It is not a race as:

- the speed of car Y is twice that of car X 2km/min.
- the speed of car Z is half that of car X.

Illustrate this situation with a distance–time graph. Assume that car X travels at 1 km/min.

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Questions to complete

The following are the minimum number of questions you are expected to answer. There is nothing wrong with answering more!

Ex 16B
Questions: 4,5, 7, 8, 9

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