

# 1. Proportionality

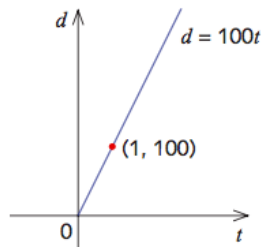
Direct proportion:  $y = kx$

Inverse proportion:  $y = \frac{k}{x}$

The statement ' $d$  is directly proportional to  $t$ ' is written as

$$d \propto t$$

The graph of  $d$  against  $t$  is a straight line passing through the origin. The gradient of the line is 100.



Determine the following cases as direct proportion or inverse proportion

a) Joseph invested a huge amount of effort in his homework and came first in his yearly exam.

Direct

b) Rachel realised the more time she spent at the gym the smaller size shirt she can fit into.

Inverse

c) Steve realised the longer he spent at work meant less time he has with his family.

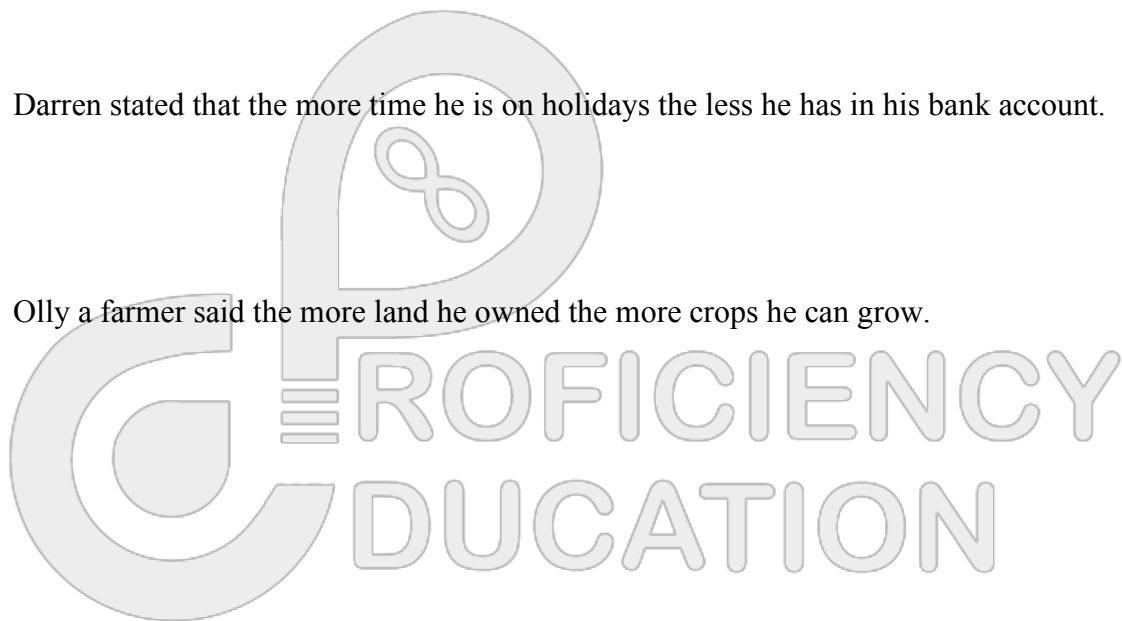
Inverse

d) Darren stated that the more time he is on holidays the less he has in his bank account.

Inverse

e) Olly a farmer said the more land he owned the more crops he can grow.

Direct



➤ **Direct Proportion**

- the equation for direct proportion is  $y = kx$

The amount of petrol used by a car travelling at a constant speed is directly proportional to the distance travelled.

- a) If a car uses 6 L of petrol to travel 54 km, Find k and form a variance equation.

- b) how much petrol will be used to travel 230 km?

$$P = \frac{1}{9}d$$

- c) how far can a car travel with 50L of petrol.

25.56 L

The distance a cyclist can travel in a given time (d km) is in direct linear proportion to her speed (s km/h).

- d) if the cyclist travels 60 km at a speed of 20 km/h, calculate the constant of proportionality and form a variance equation.

450 km

- a) Calculate the distance she can travel at 25 km/h.

$$d = 3s$$

- b) At what speed would she travel to cover 54km?

75 km

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