

6J / CLASSROOM LESSON

Direct variation

Name: _____ Class: _____ Date: _____

Today you will

- Build and use a direct-variation model.
- Recognise a proportional relationship from its graph.

Keep these ideas

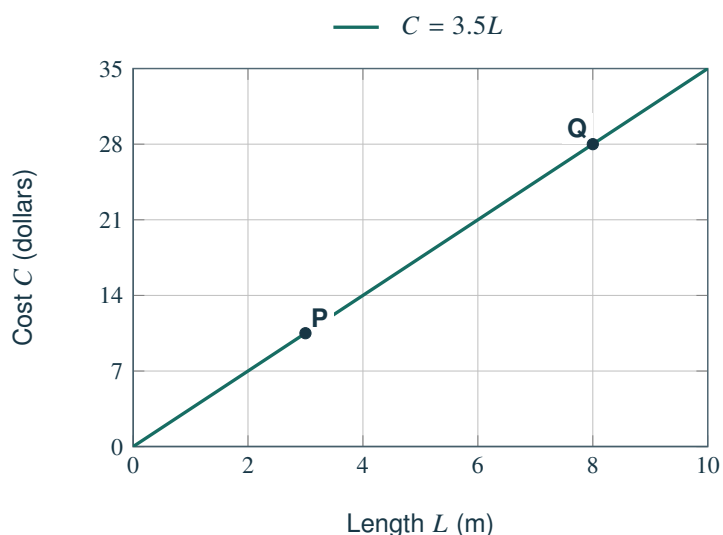
Direct variation has the form $y = kx$; $k = \frac{y}{x}$ for $x \neq 0$.

Its graph is a straight line through $(0, 0)$.

A fixed non-zero charge means the total is not directly proportional to the quantity.

Worked example

Ribbon costs \$10.50 for 3 m, with no fixed charge. Find a cost model and the length that costs \$28.



1. $k = \frac{10.50}{3} = 3.50$ dollars per metre, so
 $C = 3.5L$.

2. $28 = 3.5L$, so $L = \frac{28}{3.5} = 8$ m.

Answer

$C = 3.5L$; \$28 buys 8 m.

The worked model links ribbon length and cost.

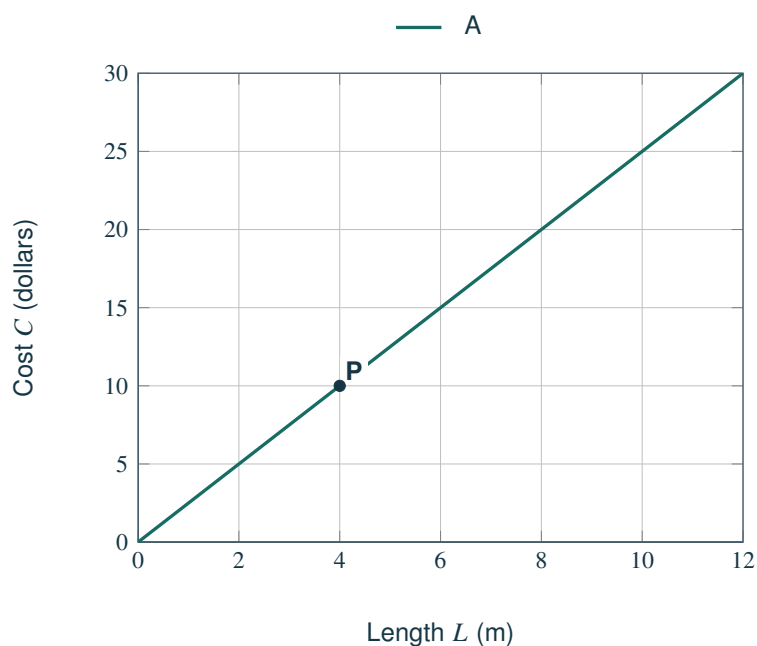
Your turn

1. M varies directly with V . If $M = 9.9$ when $V = 4.5$, find k and the model.

2. A liquid has mass $M = 2.2V$, in kilograms. Find its volume V , in litres, when $M = 33$.

Apply it on the graph

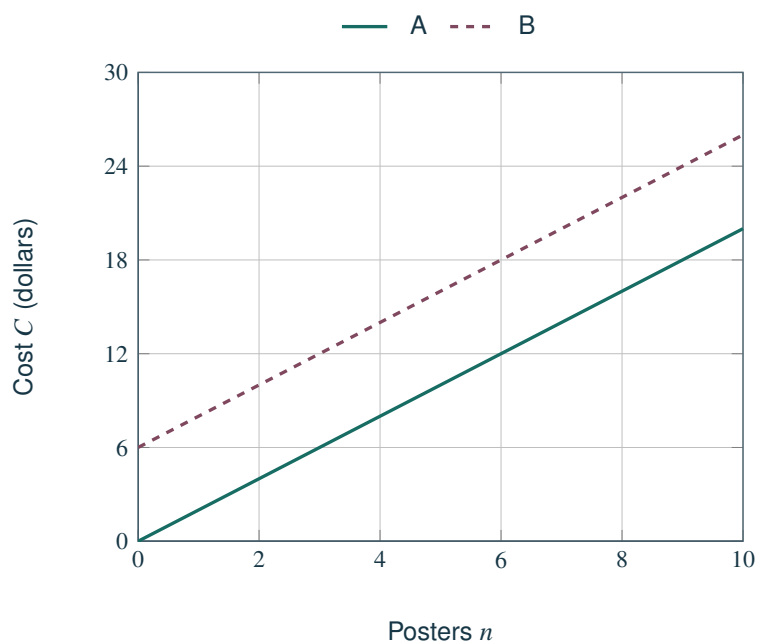
Write your calculations beside each diagram. Label any points or curves you add.



Questions 3-4: Line A and the given point $P(4, 10)$.

3. Line A shows cord cost. Use the marked point $P(4, 10)$ to find the price per metre and write a cost model.

4. Use the same graph as Question 3. How many metres of cord can you buy for \$30? Confirm your reading by calculation.



Questions 5-6: The supplied price lines for services A and B.

5. The graph compares two printing services. Which service has cost directly proportional to the number of posters? Explain using the graph.

6. Use the same graph as Question 5. You need 9 posters and have \$20. Calculate both prices and choose an affordable service.