



Direct proportion

- Recognising direct proportion
- Calculating unknown values using direct proportion
- Exploring the connection between direct proportion and graphs

Keywords

You should know

explanation 1

1 The tables below show pairs of values of x and y .

Which tables show x and y in direct proportion?

a

x	1	2	3
y	3	6	9

b

x	1	2	3
y	7	9	11

c

x	4	12	20
y	2	6	10

d

x	1.5	2	2.5
y	3.5	4	4.5

e

x	10	20	30
y	4	8	12

f

x	50	75	100
y	15	20	25

2 Copy and complete these tables so that x and y are in direct proportion.

a

x	5	7	9
y	10		

b

x	8	9	
y	24		33

c

x	10	18	
y		9	15

d

x	15	21	27
y			9

e

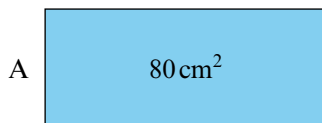
x	7		19
y	3.5	8	

f

x	1.2	1.5	
y		4.5	5.1

explanation 2

3 Rectangles A and B have the same height.



11.3 cm



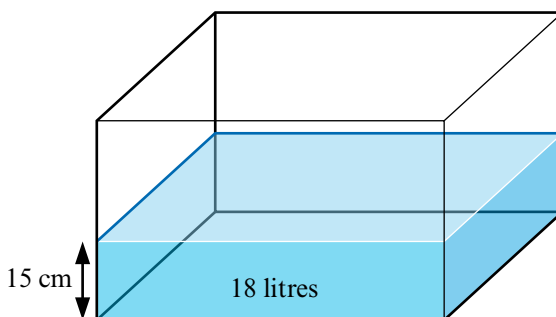
22.6 cm

Find the area of rectangle B.

- 4** Fred is pouring water into his fish tank. It takes 18 litres of water to fill the tank to a depth of 15 cm.

- a** How much water is needed to make the depth 5 cm?
- b** Fred wants the depth to be 25 cm.

How much water will he need in the tank?



- 5** Some instructions for making porridge say that 42 g of porridge oats should be mixed with 300 ml of milk.

- a** What amount of porridge oats should be mixed with 100 ml of milk?
- b** Mrs Brown uses 400 ml of milk to make enough porridge for two small bowls. What amount of porridge oats should she use?

- 6** A regional television company charges advertisers £15 900 for 30 seconds of air time in the late evening.

- a** How much would it cost for 10 seconds of air time at this rate?
- b** An advertiser buys 8 evening spots of 20 seconds. How much does this cost?
- c** The cost to advertise across all regions is £45 000 for 30 seconds of air time. What is the cost for 8 spots of 20 seconds across all regions?

- 7** A skip hire company charges the amounts shown in the table.

- a** Give an example to show that the cost to hire is *not* proportional to the size of the skip.
- b** If the cost to hire was proportional to the size of the skip, how much would it cost for the 10 cubic yard skip, based on the 2 cubic yard price?

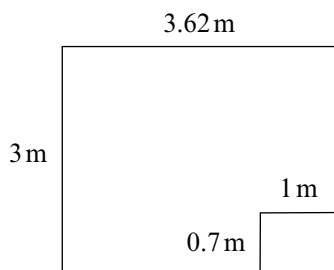
Size (cubic yards)	Cost to hire
2	£125
3	£150
6	£212
8	£250
10	

- 8** Some carpet is on sale for £52 per square metre.

The carpet is sold from a roll that is 4 m wide.

a How much does it cost for each metre of carpet from the roll?

b The diagram shows the measurements of Jenny's lounge.



i What length of carpet must Jenny buy for her lounge?

ii How much will the carpet cost?

- 9** Tariq decides to swim a mile at his local swimming pool.

He has to swim 48 lengths of the pool.

He swims 30 lengths in 25 minutes.

How long does Tariq take to swim 48 lengths at this speed?

- 10** The ingredients for sticky toffee pudding are shown here.

The amounts are based on a recipe for 6 people.

Sticky toffee pudding recipe	
<u>Pudding</u>	<u>Sauce</u>
150 g dates	180 g butter
250 ml hot water	360 g brown sugar
60 g butter	250 ml double cream
50 g caster sugar	
2 eggs	
150 g self-raising flour	

a Work out the amounts needed to serve 3 people.

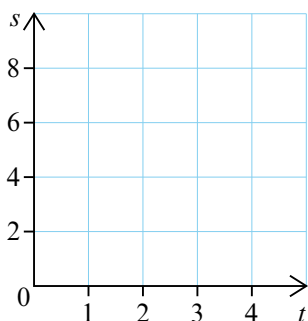
b How much brown sugar is needed to make the pudding for 9 people?

c How much butter is needed to make the pudding for 5 people?

- 11 a** Copy and complete the table below to show that s is directly proportional to t .

t	0	2	4
s			8

- b** Copy these axes and plot the values from the table as coordinates.

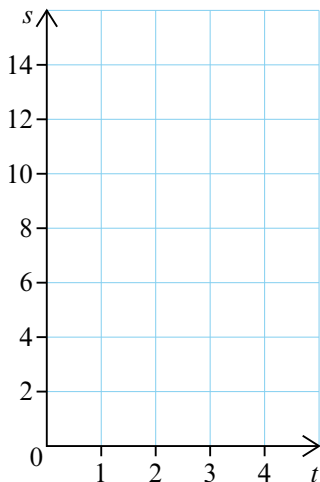


- c** Join the points with a straight line.
d Write an equation connecting s and t .

- 12 a** Copy and complete this table for the equation $s = 3t + 2$.

t	0	2	4
s			

- b** Is s directly proportional to t in this case?
c Copy these axes and plot the points from your table as coordinates.



- d** Join the points with a straight line.
e What difference do you notice between this straight line and the one in question **11**?