

# Direct Proportion

## Exercise 1

- 1) If 5 books cost £15, find the cost of 8.
- 2) If 7 apples cost 63p, find the cost of 12.
- 3) If 4 batteries cost 180p, find the cost of 7.
- 4) If 5 bottles of beer cost £2.45, find the cost of 12.
- 5) Toy cars cost £3.36 for 8. Find the cost of 10 cars.
- 6) Crisps cost £1.32 for 12 packets. Find the cost of 20 packets.
- 7) Stair carpet costs £78 for 12 m. Find the cost of 15 m.
- 8) The total weight of 7 ceramic tiles is 1750 g.  
How much do 11 tiles weigh?
- 9) A machine fills 2000 bottles in 10 minutes.  
How many bottles will it fill in 7 minutes?
- 10) The total contents of 8 cartons of fruit drink is 12 litres.  
How much fruit drink is there in 3 cartons?
- 11) Find the cost 15 cakes if 9 cakes cost £2.07.
- 12) Find the cost of 7 screws if 20 screws cost £4.60.
- 13) Pencils cost 75p for 3. How much will a dozen cost?
- 14) 8 bars of soap cost £1.56. How much will 12 bars cost?
- 15) A car travels 456 km on 40 litres of petrol.  
How far should it go on a full tank of 60 litres?
- 16) 72 books weigh 9 kg. How many books would weigh 6 kg?
- 17) A hotel charge for 5 days was £115.  
What would the charge be for 8 days?
- 18) 15 articles cost £2.10. Find the cost of 36 of the same articles.

## Exercise 2

- 1) A machine takes 20 seconds to make 8 coins.  
How long does it take to make 50 coins?
- 2) A plane flies 50 km in 15 minutes.  
How long will it take to fly 300 km?
- 3) If 8 pencils cost 56p, how many can be bought for 70p?
- 4) 6 pineapples can be bought for £3.12.  
How many can be bought for £5.20?
- 5) If  $20 \text{ m}^2$  of carpet costs £150.  
What area of carpet can be bought for £90?
- 6) Oranges cost £1.68 for 12. How many can be bought for £90.
- 7) Oranges cost £1.40 per dozen. Find the cost of 27 oranges.
- 8) 500 two-pence coins placed in a row measure 13 metres.  
What would 75 coins measure?
- 9) A stack of 350 sheets of paper is 2.1 cm high.  
How high would 500 sheets stand?
- 10) A car uses 10 litres of petrol in 75 km. How far will it go on 8 litres?
- 11) A wire 11 cm long has a mass of 187 g.  
What is the mass of 7 cm of this wire?
- 12) A shopkeeper can buy 36 toys for £20.52.  
What will he pay for 120 toys?
- 13) 7 cycles cost £623.
  - a) What is the cost of 3 cycles?
  - b) How many cycles can be bought for £979?
- 14) 11 pens cost £9.35.
  - a) What is the cost of 15 pens?
  - b) How many pens can be bought for £17?

- 15)** A car travels 210 km on 30 litres of petrol.  
How much is needed for a journey of 245 km?
- 16)** A light aircraft flies 375 km on 150 litres of fuel.  
How much fuel is needed for a journey of 500 km?
- 17)** A tank travels 140 miles on 40 gallons of fuel.  
How much fuel is needed for a journey of 245 miles?
- 18)** A  $600 \text{ cm}^2$  pane of glass costs £25.  
**a)** What area of glass costs £52?  
**b)** Calculate the cost of a pane of glass of area  $750 \text{ cm}^2$ .
- 19)**  $300 \text{ cm}^3$  of lead weighs 3390 g. Calculate  
**a)** The weight of 500 g of lead.  
**b)** The volume of lead that weighs 5085 g.
- 20)** A 250 ml tin of varnish will cover  $4.5 \text{ m}^2$ .  
**a)** What area will a 450 ml tin cover?  
**b)** How much varnish is needed to cover an area of  $3.6 \text{ m}^2$ .
- 21)** A tree's shadow is proportional to its height.  
A tree 12 m tall casts a shadow of 18 m.  
Calculate the length of the shadow of a 10 m tall tree.

### Exercise 3

- 1)  $2\frac{1}{2}$  m of metal tube cost £1.40. Find the cost of  $7\frac{1}{2}$  m.
- 2)  $3\frac{3}{4}$  kg of sweets costs £2.60. Find the cost of  $4\frac{1}{2}$  kg.
- 3) The cost of a phone call lasting 3 minutes 30 seconds was 52.5 p.  
At this rate, what was the cost of a call lasting 5 minutes 20 seconds?

- 4)  $80 \text{ cm}^3$  of calcium weigh 120 g.
  - a) Calculate the weight of  $60 \text{ cm}^3$ .
  - b) What volume of calcium weighs 270 g?

- 5) This is a recipe for 6 scones.

110 g self raising flour

20 g butter

750 ml milk

1 tablespoon caster sugar

How much of each ingredient is needed to make 15 scones?

- 6) Francis stores holiday snaps on his computer.

His 24 photos take 10.704 megabytes of memory.

How much memory would a film with 36 photos need, assuming that the memory requirement is directly proportional to the number of photos.

- 7)  $800 \text{ cm}^3$  of mercury weigh 10.88 kg. Calculate

a) Weight of  $350 \text{ cm}^3$

b) The volume of 7.5 kg of mercury, correct to 1 decimal place.

- 8) At lunchtime it takes the canteen 15 minutes to serve 120 pupils in Danielle's year. Another year group has 16 more pupils.

How much **longer** should it take to serve them?

- 9) It takes Joanne 2 hours to fly 688 miles from Rome to Paris.  
At the same speed how long would it take her to fly from Rome to London, which is an extra 220 miles away?  
Give your answer correct to the nearest minute.
- 10) The telephone directory for Graham's area weighs 1.95 kg and has 1600 pages. How much, correct to 3 significant figures, would you expect a directory with
- a) 100 more pages to weigh
  - b) 100 fewer pages to weigh?
- 11) A girl makes a model of a ship which is 576 ft long and has one mast 54 feet high. If the length of the model is 4 feet, what length must she make the model mast?
- 12) In his will a man left each of his employees a legacy proportional to the number of years he had been employed by his firm.  
An employee with 35 years' service received £2625.  
How many years' service had an employee who received £4050.
- 13) Travelling at 60 mph a train takes a certain time to do a journey of 400 miles. How far would an aeroplane travelling at 330 mph go in the same time?
- 14) If the cost of carriage of 35 tons for a certain distance is £1540, what weight can be carried the same distance for £2750.
- 15) It is estimated that 2 tons of coal occupy 81 cu ft. How many tons of coal are there in a stack of coal 15 ft long, 12 ft broad, and 9 ft high.
- 16) A fitted carpet for a room 4 m by 3 m costs £1200. How much will the same kind of carpet cost for a room 5 m by 2 m?
- 17) In order to measure the height of a lamp post, a boy measures the lengths of the shadows cast by the lamp post and by a stick, 3 ft 8 in high. He finds the lengths of the shadows to be 8 ft 9 in and 2 ft 9 in respectively. Find the height of the lamp post.