

Direct proportion

Year 7 About 65 minutes Calculator allowed 50 marks



Hints online, answers free with an account:
mathswariz.uk/worksheets/ks3-year-7-direct-proportion/

Date

A Do Now

Quick questions to start.

- A1

Needed today

[1 mark]

A2

Needed today

[1 mark]
- Work out 1.35×4 .

Work out $7.20 \div 6$.

Answer

- A3

Last lesson

[1 mark]

A4

From chapter 11

[1 mark]
- Work out $0.8 \div 0.02$.

A map has a scale of 1 : 50 000.
How many kilometres does 6 cm on the map stand for?

Answer

Answer

B Example, then your turn

Year 7

Your teacher works through each example with you. Then try the one beside it.

EXAMPLE 1

A lorry travels at a steady speed, so the distance is in direct proportion to the time. In 12 minutes it travels 15 km. Work out the missing distances in the table.

Time (min)	Distance (km)
4	?
12	15
24	?
36	?
60	?

Hint Look at how the time changes from 12 minutes, then do the same to the distance.

Answer 2 min: | 10 min: | 18 min: |

- B1

[3 marks]
- Water flows from a hose at a steady rate. In 6 minutes, 45 litres flow out. Work out the volumes that flow out in 2, 10 and 18 minutes.

Time (min)	Litres
2	?
6	45
10	?
18	?

EXAMPLE 2

5 kg of potatoes cost £3.40. The cost is in direct proportion to the mass. Work out the cost of 8 kg of potatoes.

Hint 8 is not a whole-number multiple of 5. Find the cost of 1 kg first.

EXAMPLE 3

450 g of cheese costs £5.40. How much cheese, in grams, can you buy for £8.40?

Hint Work in pence. Find the cost of 1 g, then see how many grams £8.40 pays for.

EXAMPLE 4

An exchange rate is £20 = €23. Change £70 into euros. Change €115 into pounds.

Hint £70 is 3.5 lots of £20. €115 is how many lots of €23?

EXAMPLE 5

The table shows the cost of hiring a bike. Is the cost in direct proportion to the number of hours? Give a reason.

Hours	Cost (£)
2	30
5	75
8	120

Hint Work out the cost for one hour each time. In direct proportion it is always the same.

B2 7 m of rope costs £9.80. The cost is in direct proportion to the length. Work out the cost of 12 m of the rope. [2 marks]

Answer £

B3 250 ml of olive oil costs £3.50. How much oil, in ml, can you buy for £12.60? [2 marks]

Answer ml

B4 An exchange rate is £15 = 18 US dollars. Change £55 into US dollars. Change 102 US dollars into pounds. [4 marks]

Answer US dollars £

B5 The table shows the cost of tickets for a show. Is the cost in direct proportion to the number of tickets? Give a reason. [2 marks]

Tickets	Cost (£)
3	24
5	36
9	60

Answer

C Practice

Year 7

- C1** A tap drips at a steady rate: 75 drips in 15 minutes. How long does it take to drip 1000 times? Give your answer in hours and minutes. [2 marks]

Answer ... hours ... minutes

- C2** A baker uses 1.4 kg of flour to make 8 rolls. How many rolls can the baker make from 5 kg of flour? [3 marks]

Answer rolls

- C3** y is in direct proportion to x . Work out the missing value a . [2 marks]

x	y
6	14
15	a

- C4** 4 litres is about the same as 7 pints. How many pints is 1 litre? How many litres is 1 pint, to 2 decimal places? [2 marks]

Answer pints litres

Answer $a = \dots\dots$

- C5** 12 litres of petrol cost £17.64. Work out the cost of 31.4 litres. Give your answer to the nearest penny. [2 marks]

Answer £

D Exam-style questions

GCSE Foundation

- D1** Here are the ingredients needed to make 10 flapjacks. Harry has 500 g of butter, 600 g of oats and 300 g of sugar. What is the greatest number of flapjacks Harry can make? You must show your working. [4 marks]

Ingredient	For 10 flapjacks
Butter	120 g
Oats	150 g
Sugar	80 g

Answer flapjacks

- D2** Sam says, "The fare is in direct proportion to the distance, because every extra 2 miles costs £4 more." [2 marks]

The table shows taxi fares. Is Sam correct? Give a reason for your answer.

Miles	Fare (£)
2	7
4	11
6	15

- D3** A pair of trainers costs £72 in London. The same trainers cost €84 in Paris. The exchange rate is £1 = €1.15.

- (a) Work out the cost of the trainers in Paris in pounds. Give your answer to the nearest penny. [2 marks]

Answer £

- (b) In which city are the trainers cheaper, and by how much in pounds? [2 marks]

Answer by £

Total for D3: 4 marks

- D4** A van uses 18 litres of diesel to travel 240 km. The amount of diesel used is in direct proportion to the distance.

- (a) Work out the amount of diesel used to travel 400 km. [2 marks]

Answer litres

- (b) Diesel costs £1.52 per litre. Work out the cost of the diesel for a journey of 340 km. [3 marks]

Answer £

Total for D4: 5 marks

D5 A printer prints 144 pages in 4 minutes, at a steady rate.

(a) How many pages does it print in 30 seconds?

[2 marks]

Answer pages

(b) Kim needs to print 2450 pages. Will the job take more than one hour? Give a reason for your answer.

[2 marks]

Total for D5: 4 marks

E Extension

Stretch

No route is given. The hints are at the end of the sheet. Use one at a time.

E1 A shop sells cheese by mass. The cost is in direct proportion to the mass. 240 g of the cheese costs £1.56 more than 160 g of the same cheese. Work out the cost of 1 kg of the cheese. [3 marks]

Answer £

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** What does the extra mass cost?
Hint 2 $240 - 160 = 80$ g, so 80 g of cheese costs £1.56.
Hint 3 $1000 \div 80 = 12.5$, so 1 kg costs $1.56 \times 12.5 = £19.50$.

How did it go?

Colour one circle on each line: not yet, nearly, yes.

I can tell from a table whether two quantities are in direct proportion.



I can find a missing amount by scaling or through the amount for one unit.



I can use a rate to convert both ways, such as between currencies.

