



Ratio and direct proportion

About 45 minutes Calculator allowed 39 marks

Date _____

A Do Now

The first question is what today's lesson needs. The others bring back earlier topics.

- A1** Needed today [2 marks]

$x : y = 4 : 3$ and $y : z = 7 : 4$.
Find $x : z$ in its simplest form.

Answer

A2 From chapter 3 [2 marks]

Times, t minutes: $8 < t \leq 12$
(frequency 2), $12 < t \leq 16$
(frequency 6), $16 < t \leq 20$
(frequency 8). Work out an estimate of the mean time.

Answer

- A3** Last lesson [2 marks]

Find an expression for the n th term of the quadratic sequence
9, 16, 25, 36, 49, ...

Answer

A4 Key Stage 3 [2 marks]

Given that $\frac{20}{24} = \frac{30}{x}$, find x .

Answer

B Example, then your turn

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

EXAMPLE 1

Share £264 in the ratio 5 : 7.

Hint Add the parts of the ratio to find how many parts there are altogether.

- B1** Share £203 in the ratio 3 : 4. [2 marks]

Answer £ and £

EXAMPLE 2

A 300 g bag of nuts costs £2.55. A 500 g bag costs £4.10. Which bag is better value?

Hint Work out the cost of one gram from each bag, in pence.

B2 A pack of 6 yoghurts costs £2.94. A pack of 10 of the same yoghurts costs £4.80. Which is better value? Show your working. [3 marks]

Answer

c Practice

C1 Write 48 minutes : 2 hours in the form $1 : n$. [2 marks]

Answer

C2 8 identical books weigh 5.6 kg. Work out the weight of 13 of the books. [2 marks]

Answer

C3 Juice and water are mixed in the ratio 3 : 8. How much juice goes with 440 ml of water? [2 marks]

Answer

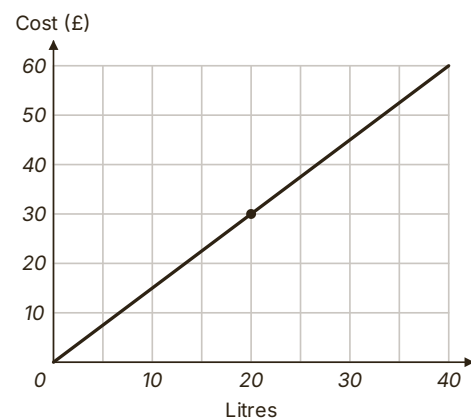
C4 Sam and Tia share sweets in the ratio 3 : 5. Tia gets 18 more than Sam. How many sweets are there? [2 marks]

Answer

C5 $a : b = 3 : 4$ and $b : c = 6 : 5$. Write $a : b : c$ in its simplest form. [2 marks]

Answer

C6 The graph shows that the cost of petrol is directly proportional to the number of litres bought. Work out the cost of 70 litres. [2 marks]



Answer

D Exam-style questions

- D1** Ellie says, "When £160 is shared in the ratio 3 : 5, the smaller share is £96, because $160 \div 5 = 32$ and $3 \times 32 = 96$." [2 marks]

Explain why Ellie is wrong, and give the correct smaller share.

- D2** Concrete is made by mixing cement, sand and gravel in the ratio 1 : 2 : 4 by mass. A builder makes 280 kg of concrete.

- (a) Work out the mass of gravel he uses. [2 marks]

Answer

- (b) Cement is sold in 25 kg bags. How many bags of cement must he buy? [2 marks]

Answer

- (c) For his next job he has only 75 kg of sand, and plenty of cement and gravel. [2 marks]
Work out the greatest mass of concrete he can make.

Answer

Total for D2: 6 marks

- D3** Ali and Ben have money in the ratio 5 : 3. Ali gives Ben £20. Now they have the same amount. How much did Ali have at the start? [3 marks]

Answer

E Extension

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

- E1** Jug A holds 2 litres of squash and water in the ratio 1 : 4. Jug B holds 3 litres of squash and water in the ratio 2 : 3. Both jugs are poured into one bowl. Write the ratio squash : water in the bowl in its simplest form. [3 marks]

Answer

Extension hints

Cover these with paper. Uncover one at a time.

- E1** **Hint 1** Work out how much squash is in each jug.
- Hint 2** Jug A has $2 \div 5 = 0.4$ litres of squash; jug B has
 $3 \div 5 \times 2 = 1.2$ litres.
- Hint 3** Squash = $0.4 + 1.2 = 1.6$ litres, water = $5 - 1.6 = 3.4$
 litres, so $1.6 : 3.4 = 16 : 34 = 8 : 17$.

How did it go?

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

I can write a ratio in its simplest form
and in the form $1 : n$. ☐ ☐ ☐

I can share an amount in a ratio and
use the unitary method. ☐ ☐ ☐

I can decide which of two packs is
better value. ☐ ☐ ☐