

Related Calculations and Inverse Operations

Solutions

For Pearson Edexcel GCSE Mathematics (1MA1) • Foundation tier

Each question is shown in grey, followed by the working, one step per line. The final answer is in a box. *Marks* shows how the marks are usually given in the exam, and **Tip** points out a common mistake.

1 (2 marks)

Write down the missing number in each box.

(a) $540 \div \boxed{} = 9$

540 divided by the missing number gives 9.

So the missing number is $540 \div 9 = 60$

Check: $540 \div 60 = 9$ ✓

Answer: 60

(b) $\boxed{} \div 0.5 = 14$

The inverse of dividing by 0.5 is multiplying by 0.5.

$14 \times 0.5 = 7$

Check: $7 \div 0.5 = 14$ ✓

Answer: 7

Tip: Dividing by 0.5 doubles a number, so the missing number is half of 14, not 28.

2 (3 marks)

$$6.8 \times 72 = 489.6$$

Use this result to find the value of

(a) 68×7.2

68 is 6.8×10 .

7.2 is $72 \div 10$.

Multiplying by 10 and dividing by 10 cancel out.

So the answer is the same: 489.6

Answer: 489.6

Tip: One number is 10 times bigger and the other is 10 times smaller, so the answer does not change.

(b) 0.068×72

0.068 is $6.8 \div 100$.

72 is unchanged.

So the answer is $489.6 \div 100$.

$$489.6 \div 100 = 4.896$$

Answer: 4.896

(c) $489.6 \div 0.72$

From the fact: $489.6 \div 72 = 6.8$

0.72 is 100 times smaller than 72.

Dividing by a number 100 times smaller gives an answer 100 times bigger.

$$6.8 \times 100 = 680$$

Answer: 680

3 (1 mark)

You know that $58 \times 3.7 = 214.6$

Use this to write down the value of $2146 \div 5.8$

From the fact: $214.6 \div 58 = 3.7$

2146 is 10 times bigger than 214.6, so the answer is 10 times bigger.

5.8 is 10 times smaller than 58, so the answer is another 10 times bigger.

$$3.7 \times 10 \times 10 = 370$$

Check: $5.8 \times 370 = 2146$ ✓

Answer: 370

Tip: Turn the multiplication fact into a division fact first, then adjust the place value.

4 (2 marks)

$$19 \times 43 = 817$$

Use this fact to work out the value of

(a) 19×44

19×44 is one more lot of 19 than 19×43 .

$$817 + 19 = 836$$

Answer: 836

(b) $817 \div 0.43$

From the fact: $817 \div 43 = 19$

0.43 is 100 times smaller than 43.

Dividing by a number 100 times smaller gives an answer 100 times bigger.

$$19 \times 100 = 1900$$

Answer: 1900

5 (2 marks)

You are given that $8.4 \times 1.25 = 10.5$

Work out

(a) $10.5 \div 0.84$

From the fact: $10.5 \div 8.4 = 1.25$

0.84 is 10 times smaller than 8.4.

So the answer is 10 times bigger.

$$1.25 \times 10 = 12.5$$

Answer: 12.5

(b) 840×12.5

840 is 8.4×100 .

12.5 is 1.25×10 .

So the answer is $10.5 \times 100 \times 10 = 10.5 \times 1000$.

$$10.5 \times 1000 = 10\,500$$

Answer: 10 500

6 (3 marks)

(a) Work out 36×24

Split 24 into $20 + 4$.

$$36 \times 20 = 720$$

$$36 \times 4 = 144$$

$$720 + 144 = 864$$

Answer: 864

Marks: 1 mark for a complete method (e.g. a grid or column method). 1 mark for 864.

(b) Use your answer to part (a) to write down the value of $864 \div 2.4$

From part (a): $864 \div 24 = 36$

2.4 is 10 times smaller than 24.

So the answer is 10 times bigger: $36 \times 10 = 360$

Answer: 360

7 (2 marks)

Kaz says,

$$'7.2 \div 0.4 = 1.8'$$

Use a multiplication to show that Kaz is wrong.

If $7.2 \div 0.4 = 1.8$ were true, then 1.8×0.4 would be 7.2.

$18 \times 4 = 72$, and there are 2 decimal places, so $1.8 \times 0.4 = 0.72$

0.72 is not 7.2, so Kaz is wrong.

(The correct answer is 18, because $18 \times 0.4 = 7.2$.)

Answer: $1.8 \times 0.4 = 0.72 \neq 7.2$

Marks: 1 mark for working out 1.8×0.4 . 1 mark for 0.72 and saying this is not 7.2.

8 (2 marks)

Tariq has a length of rope.

He cuts 35 cm off the rope.

He then cuts the rest of the rope into 4 pieces of equal length.

Each of the 4 pieces is 60 cm long.

Work out the length of the rope Tariq started with.

Work backwards using inverse operations, in reverse order.

The 4 equal pieces together: $4 \times 60 = 240$ cm

Add back the 35 cm he cut off first: $240 + 35 = 275$ cm

Check: $275 - 35 = 240$, $240 \div 4 = 60$ ✓

Answer: 275 cm

Tip: Undo the steps in the **opposite order**. Adding 35 to 60 and then multiplying by 4 gives the wrong answer.

Marks: 1 mark for 4×60 . 1 mark for 275.

9 (2 marks)

Sophie says,

' $32 \times 7 = 224$, so $3.2 \times 0.7 = 22.4$ '

Is Sophie correct?

You must give a reason for your answer.

3.2 has 1 decimal place and 0.7 has 1 decimal place.

So the answer has $1 + 1 = 2$ decimal places.

$224 \div 100 = 2.24$, so $3.2 \times 0.7 = 2.24$

Check with an estimate: $3 \times 0.7 = 2.1$, which is close to 2.24, not 22.4.

Answer: No, $3.2 \times 0.7 = 2.24$

Tip: Multiplying by 0.7 makes a number smaller, so the answer must be less than 3.2. Count the decimal places in the question to place the decimal point.

Marks: 1 mark for 2.24, or an estimate such as $3 \times 0.7 = 2.1$ or $3 \times 1 = 3$. 1 mark for No, with 2.24 or a correct reason.

10 (3 marks)

Mia buys 14 pens.

Each pen costs £1.35

She pays with a £20 note.

You are given that $14 \times 135 = 1890$

How much change should Mia get?

£1.35 is 135p.

Cost of 14 pens: $14 \times 135 = 1890\text{p}$

$1890\text{p} = \text{£}18.90$

Change: $20 - 18.90 = 1.10$

Answer: £1.10

Marks: 1 mark for using $14 \times 135 = 1890$ to get £18.90. 1 mark for $20 - 18.90$. 1 mark for £1.10.
