

Written Methods for the Four 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)

Work out

(a) $5\,286 + 947$

Use column addition. Line up the ones under the ones.

$$\begin{array}{r} 5\,286 \\ + 947 \\ \hline 6\,233 \end{array}$$

Ones: $6 + 7 = 13$, write 3, carry 1

Tens: $8 + 4 + 1 = 13$, write 3, carry 1

Hundreds: $2 + 9 + 1 = 12$, write 2, carry 1

Thousands: $5 + 1 = 6$

Answer: 6233

(b) $8\,040 - 3\,675$

Use column subtraction, lining up the columns.

$$\begin{array}{r} 8\,040 \\ - 3\,675 \\ \hline 4\,365 \end{array}$$

Ones: $0 - 5$ will not go, so exchange a ten: $10 - 5 = 5$

Tens: now $3 - 7$ will not go. There are no hundreds, so exchange a thousand.

Tens: $13 - 7 = 6$

Hundreds: $9 - 6 = 3$

Thousands: $7 - 3 = 4$

Check: $4365 + 3675 = 8040$ ✓

Answer: 4365

Tip: Check a subtraction by adding your answer to the number you took away. You should get back to the number you started with.

2 (3 marks)

Work out 264×38

Split 38 into $30 + 8$.

$264 \times 30 = 7920$

$264 \times 8 = 2112$

Add the two parts: $7920 + 2112 = 10\,032$

Check with an estimate: $250 \times 40 = 10\,000$ ✓

Answer: 10 032

Tip: Use every part of both numbers. In a grid, 264×38 needs 200, 60 and 4 each multiplied by 30 and by 8 (six products). Do not just multiply the tens together and the ones together.

Marks: 1 mark for a complete method (e.g. a grid or long multiplication). 1 mark for correct parts, e.g. 7920 and 2112. 1 mark for 10 032.

3 (2 marks)

Work out $2184 \div 6$

Use short division (bus stop).

6 into 2 does not go, so look at 21.

$21 \div 6 = 3$ remainder 3. Carry the 3, making 38.

$38 \div 6 = 6$ remainder 2. Carry the 2, making 24.

$24 \div 6 = 4$

Check: $364 \times 6 = 2184$ ✓

Answer: 364

Marks: 1 mark for a correct method with at most one slip. 1 mark for 364.

4 (2 marks)

Work out 4.7×3.6

Ignore the decimal points and multiply the whole numbers:

$47 \times 36 = 1410 + 282 = 1692$

4.7 has 1 decimal place and 3.6 has 1 decimal place.

So the answer has $1 + 1 = 2$ decimal places: 16.92

Check with an estimate: $5 \times 4 = 20$, so about 17 is sensible.

Answer: 16.92

Tip: Estimate first ($5 \times 4 = 20$) and use it to check where the decimal point goes. 169.2 or 1.692 would not be sensible.

Marks: 1 mark for 1692 (the correct digits). 1 mark for 16.92.

5 (2 marks)

Work out $7.2 \div 0.04$

Make the number you are dividing by a whole number.

Multiply both numbers by 100: $7.2 \div 0.04 = 720 \div 4$

$$720 \div 4 = 180$$

Answer: 180

Tip: Multiply both numbers by the same amount. Dividing by a number less than 1 makes the answer bigger, so it must be more than 7.2.

Marks: 1 mark for $720 \div 4$ (or an equivalent division). 1 mark for 180.

6 (1 mark)

Work out 0.6×0.03

Multiply the whole numbers: $6 \times 3 = 18$

0.6 has 1 decimal place and 0.03 has 2 decimal places.

So the answer has $1 + 2 = 3$ decimal places.

0.018

Answer: 0.018

7 (3 marks)

183 students are going on a school trip.

Each minibus can carry 16 students.

How many minibuses are needed?

Divide the number of students by the number in each minibus.

$183 \div 16 = 11$ remainder 7 (about 11.4)

11 minibuses carry $11 \times 16 = 176$ students.

The other 7 students still need a minibus.

So $11 + 1 = 12$ minibuses are needed.

Answer: 12

Tip: Everyone must go on the trip, so round up. 11 minibuses would leave 7 students behind.

Marks: 1 mark for $183 \div 16$. 1 mark for 11.4... or 11 remainder 7. 1 mark for 12.

8 (3 marks)

Ella buys 4 packets of crisps at £1.35 each and 2 magazines at £3.75 each.

How much change should she get from £20?

Cost of the crisps: $4 \times £1.35 = £5.40$

Cost of the magazines: $2 \times £3.75 = £7.50$

Total cost: $£5.40 + £7.50 = £12.90$

Change: $£20 - £12.90 = £7.10$

Answer: £7.10

Marks: 1 mark for 4×1.35 or 2×3.75 . 1 mark for the total, £12.90. 1 mark for £7.10.

9 (3 marks)

Ali saves £35 each week.

Work out the number of whole weeks it will take Ali to save £500

Divide the amount he needs by the amount he saves each week.

$500 \div 35 = 14$ remainder 10 (about 14.3)

After 14 weeks he has $14 \times £35 = £490$

£490 is not enough.

After 15 weeks he has $\pounds 490 + \pounds 35 = \pounds 525$, which is enough.

Answer: 15 weeks

Marks: 1 mark for starting, e.g. $500 \div 35$ or adding up 35s. 1 mark for 14.28... or $\pounds 490$ after 14 weeks. 1 mark for 15.

10 (1 mark)

Nina says $0.2 \times 0.4 = 0.8$

Explain what Nina has done wrong.

$$2 \times 4 = 8$$

0.2 has 1 decimal place and 0.4 has 1 decimal place.

So the answer needs 2 decimal places: $0.2 \times 0.4 = 0.08$

Nina's answer only has 1 decimal place.

Answer: It should be 0.08, not 0.8

Tip: Count the decimal places in the question. The answer has the same total number of decimal places.

11 (3 marks)

Theo is running a charity quiz for 75 people.

He needs one paper cup for each person.

Paper cups are sold in packs of 20 for $\pounds 1.85$ or in packs of 12 for $\pounds 1.20$

Theo will buy only one size of pack.

Which size of pack should Theo buy so that he spends the least money?

You must show your working.

Packs of 20: $75 \div 20 = 3$ remainder 15, so he needs 4 packs.

Cost: $4 \times \pounds 1.85 = \pounds 7.40$

Packs of 12: $75 \div 12 = 6$ remainder 3, so he needs 7 packs.

Cost: $7 \times \pounds 1.20 = \pounds 8.40$

£7.40 < £8.40

Answer: Packs of 20 (£7.40 compared with £8.40)

Tip: Round the number of packs up. 3 packs of 20 is only 60 cups, which is not enough for 75 people.

Marks: 1 mark for finding 4 packs of 20 or 7 packs of 12. 1 mark for both costs, £7.40 and £8.40. 1 mark for the correct conclusion with both costs.
