

Rounding

Solutions

For AQA GCSE Mathematics (8300) • 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 (3 marks)

(a) Round 4 687 to the nearest 10

4687 is between 4680 and 4690.

Look at the units digit: it is 7.

7 is 5 or more, so round up.

Answer: 4690

(b) Round 4 687 to the nearest 100

4687 is between 4600 and 4700.

Look at the tens digit: it is 8.

8 is 5 or more, so round up.

Answer: 4700

(c) Round 4 687 to the nearest 1000

4687 is between 4000 and 5000.

Look at the hundreds digit: it is 6.

6 is 5 or more, so round up.

Answer: 5000

Tip: Your answer must still be about the same size as the number you started with. 4687 to the nearest 1000 is 5000, not 5.

2 (3 marks)

- (a) Round 3.1462 to 1 decimal place.

Keep 1 digit after the decimal point: 3.1|462

The next digit is 4.

4 is less than 5, so round down.

Answer: 3.1

- (b) Round 3.1462 to 2 decimal places.

Keep 2 digits after the decimal point: 3.14|62

The next digit is 6.

6 is 5 or more, so round up: 3.14 becomes 3.15.

Answer: 3.15

- (c) Round 0.0496 to 2 decimal places.

Keep 2 digits after the decimal point: 0.04|96

The next digit is 9, so round up.

0.04 becomes 0.05.

Answer: 0.05

3 (3 marks)

- (a) Round 52 840 to 1 significant figure.

The first significant figure is the 5 (it means 50 000).

The next digit is 2, which is less than 5, so round down.

Fill the other places with zeros.

Answer: 50 000

Tip: Keep the number the right size. 52 840 to 1 s.f. is 50 000, not 5.

- (b) Round 0.003 862 to 2 significant figures.

Zeros at the start do not count as significant figures.

The first significant figure is 3.

Keep 2 significant figures: 0.0038 | 62

The next digit is 6, so round up: 0.0038 becomes 0.0039.

Answer: 0.0039

- (c) Round 7.098 to 3 significant figures.

Keep 3 significant figures: 7.09 | 8

The next digit is 8, so round up.

7.09 becomes 7.10.

Answer: 7.10

4 (1 mark)

Circle the number that is 6.1 when rounded to 1 decimal place.

Options: 6.01, 6.149, 6.16, 6.25

Round each number to 1 decimal place:

6.01 → 6.0

$6.149 \rightarrow 6.1$

$6.16 \rightarrow 6.2$

$6.25 \rightarrow 6.3$

Answer: 6.149

5 (2 marks)

Here is a list of four numbers.

8.86 9.13 9.04 8.95

Use **one** number from the list to complete each statement.

The number closest in value to 9 is _____

The number that rounds to 9.1 to 1 decimal place is _____

How far is each number from 9?

8.86 is 0.14 away.

9.13 is 0.13 away.

9.04 is 0.04 away.

8.95 is 0.05 away.

So 9.04 is closest to 9.

Now round each number to 1 decimal place:

$8.86 \rightarrow 8.9$, $9.13 \rightarrow 9.1$, $9.04 \rightarrow 9.0$, $8.95 \rightarrow 9.0$

So 9.13 rounds to 9.1.

Answer: 9.04; 9.13

Marks: 1 mark for 9.04. 1 mark for 9.13.

6 (1 mark)

Leo says,

‘0.0752 rounded to 1 significant figure is 0.1’

Is Leo correct? Tick a box.

Give a reason for your answer.

The zeros at the start of 0.0752 are not significant.

The first significant figure is the 7.

The next digit is 5, so round up.

0.07 becomes 0.08.

Answer: No, it is 0.08

7 (2 marks)

Work out $\frac{12.4 \times 3.87}{2.1 + 0.65}$

Give your answer correct to 3 significant figures.

Top: $12.4 \times 3.87 = 47.988$

Bottom: $2.1 + 0.65 = 2.75$

Divide: $47.988 \div 2.75 = 17.4501\dots$

To 3 significant figures: 17.4 | 501...

The next digit is 5, so round up to 17.5.

Answer: 17.5

Tip: Write down the full calculator answer first, then round. Put brackets around the bottom, or work out the top and bottom separately.

Marks: 1 mark for 17.45... on your calculator. 1 mark for 17.5.

8 (2 marks)

A circle has radius 4.3 cm.

Work out the area of the circle.

Give your answer to 1 decimal place.

Area of a circle = πr^2

$$\pi \times 4.3^2 = 58.0880 \dots$$

To 1 decimal place: 58.0 | 880 ...

The next digit is 8, so round up to 58.1.

Answer: 58.1 cm²

Marks: 1 mark for $\pi \times 4.3^2$. 1 mark for 58.1.

9 (2 marks)

Rhian has 148 photos to put in an album.

Each page of the album holds 6 photos.

How many pages does she need?

$$148 \div 6 = 24.66 \dots$$

24 pages hold only $24 \times 6 = 144$ photos.

That leaves 4 photos with no page.

So round **up** to 25 pages.

Answer: 25

Tip: In a real-life problem, think about what the answer means. The last few photos still need a page, so round up. An answer of 24.7 pages makes no sense.

Marks: 1 mark for $148 \div 6$. 1 mark for 25.

10 (2 marks)

The number of cars in a car park is 260, correct to the nearest 10.

- (a) Write down the smallest possible number of cars in the car park.

The numbers that round to 260 start halfway between 250 and 260.

255 rounds up to 260.

254 would round down to 250.

Answer: 255

- (b) Kay says,

‘There could be 265 cars in the car park.’

Is Kay correct? Tick a box.

Give a reason for your answer.

265 is halfway between 260 and 270.

A number exactly halfway rounds **up**.

So 265 rounds to 270, not 260.

The largest possible number of cars is 264.

Answer: No, 265 rounds to 270

Tip: Go 5 each side of 260, not 10. Remember that a number ending in 5 rounds up, so 265 is not allowed but 255 is.

11 (2 marks)

Ines buys four books.

She rounds the price of each book to the nearest pound.

The total of her rounded prices is £20

Work out the least possible total cost of the four books.

A price that rounds to a whole number of pounds can be up to 50p less than it.

For example, £4.50 rounds up to £5, but £4.49 rounds down to £4.

So each book can cost up to 50p less than its rounded price.

Least total: $20 - 4 \times 0.50 = 18$

Answer: £18.00

Tip: Take off 50p for **each** of the four books, not just once. And don't take off a whole pound: £4.00 is too low, because £4.00 rounds to £4, not £5.

Marks: 1 mark for $20 - 4 \times 0.50$, or four example prices that are each 50p less than a whole number of pounds. 1 mark for £18.
