

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Number

Rounding using significant figures

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments

Information

- The marks for questions are shown in brackets

Advice

- In all calculations, show clearly how you work out your answer

Questions 1 to 11 are **foundation** tier only

For questions 1 to 5 you must **NOT** use a calculator.



Q1.

A pop concert has a crowd of 2000 people rounded to 1 significant figure.
A rock concert has a crowd of 2000 people rounded to 2 significant figures.

Work out the largest possible difference between the exact numbers of the two crowds.

(Total 3 marks)

Q2.

Use approximations to estimate the value of $\frac{20.02 \times 0.49}{1.99}$

(Total 3 marks)

Q3.

Use approximations to estimate the value of $\frac{3.92^2}{0.48}$

(Total 2 marks)

Q4.

By rounding each number to 1 significant figure, estimate the answer to

$$\frac{78 \times 11.6}{391}$$

You **must** show your working.

(Total 3 marks)

Q5.

Use approximations to 1 significant figure to estimate the value of

$$\frac{0.526 \times 39.6^2}{\sqrt{97.65}}$$

You **must** show your working.

(Total 3 marks)

For questions 6 to 11 you may use a calculator.



Q6.

(a) Use your calculator to work out the exact value of $\frac{18953 \times 437}{11}$

(1)

(b) Use approximations to 1 significant figure to check if your answer to part (a) is sensible.

(3)

(Total 4 marks)

Q7.

$$\frac{1}{(\sqrt[3]{8.34})^2 \times 10.21}$$

Millie is estimating the value of
She rounds each decimal number to 1 significant figure.

(a) Work out Millie's estimate.

You **must** show your working.

(2)

(b) Millie says,

"My estimate must be more than the exact value."

Without working out the exact value, give a reason how she can know this.

(1)

(Total 3 marks)

Q8.

I think of a number.

I round the number to 3 significant figures.

I now round that number to 2 significant figures.

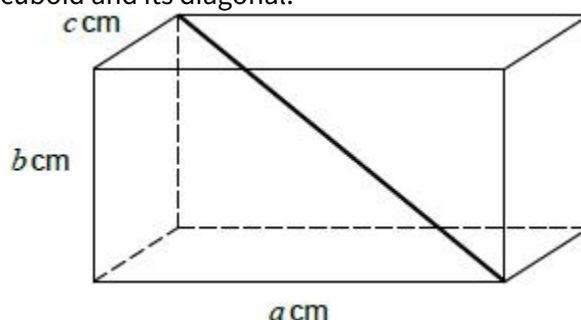
My final answer is 230.

What is the **smallest** number I could have first thought of?

(Total 2 marks)

Q9.

The diagram shows a cuboid and its diagonal.



The formula to work out the length of the diagonal in centimetres is

$$\text{Length of diagonal} = \sqrt{a^2 + b^2 + c^2}$$

(a) Work out the length of the diagonal when $a = 8$, $b = 5$ and $c = 3$

(2)

(b) Round your answer to part (a) to 2 significant figures

(1)

(c) Work out the length of the diagonal in terms of a

when $b = 4a$ and $c = 8a$

(3)

(Total 6 marks)

Q10.

The table shows the GCSE Mathematics results of the students in a school.

Grade	U	G	F	E	D	C	B	A	A*
Number of students	0	14	30	53	37	41	22	28	17

Work out the percentage of students with grade C or higher.

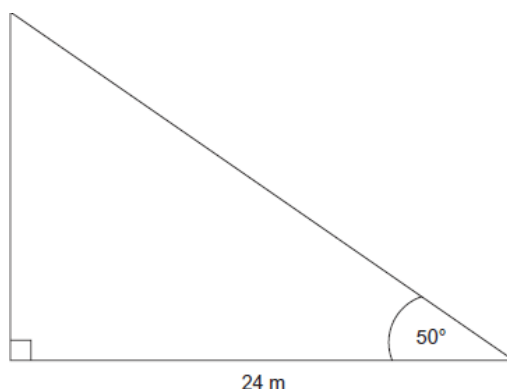
Give your answer to 3 significant figures.

(Total 5 marks)

Q11.

Work out the area of this right-angled triangle.

Not drawn accurately



Give your answer to 2 significant figures.

(Total 5 marks)

Questions 12 to 13 are **higher** tier only

For question 12 you must **NOT** use a calculator.



Q12.

The manager of a theatre records the attendance figure for a show to 2 significant figures.
A newspaper rounds the manager's figure to 1 significant figure.

THEATRE NEWS
500 attend show

What is the lowest and highest possible actual attendance?

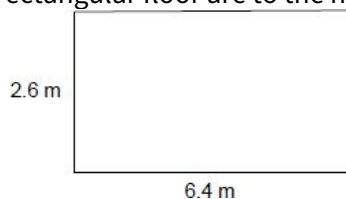
(Total 3 marks)

For question 13 you may use a calculator.



Q13.

The dimensions of a rectangular floor are to the nearest 0.1 metres.



Not drawn accurately

A force of 345 Newtons is applied to the floor.
The force is to the nearest 5 Newtons.

$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

Work out the upper bound of the pressure.
Give your answer to 4 significant figures.
You **must** show your working.

(Total 5 marks)