

8300

GCSE MATHEMATICS

Foundation and Higher tier – Questions by Topic

Number

Estimating calculations

v1.0

Name _____

Materials

For this paper you must have:

- Mathematical instruments
- You must not use a calculator



Information

- The marks for questions are shown in brackets

Advice

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

Questions 1 to 25 are **foundation** tier only

Q1.

Estimate the value of 29.6×5.2

(Total 2 marks)

Q2.

Use approximations to estimate the value of $\frac{402.5}{2.19 \times 38.7}$

(Total 3 marks)

Q3.

Use approximations to estimate the value of $\frac{10.13^2}{0.496}$

(Total 2 marks)

Q4.

Use approximations to estimate the value of $\frac{795.4}{2.1^2 \times 9.8}$
You **must** show your working.

(Total 3 marks)

Q5.

Use approximations to estimate the value of $\frac{37 \times 304}{58}$

(Total 2 marks)

Q6.

By rounding each number to the nearest 10,

estimate the answer to $\frac{61 \times 47}{102}$
You **must** show your working.

(Total 2 marks)

Q7.

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

(Total 2 marks)

Q8.

Use approximations to estimate the value of $\frac{\sqrt{98.7}}{1.94}$

(Total 2 marks)

Q9.

Estimate the value of $98.7 \div 5$

(Total 2 marks)

Q10.

Use approximations to estimate the value of 9.9×41

(Total 2 marks)

Q11.

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

(Total 3 marks)

Q12.

Work out an approximate value of $\frac{41 \times 198}{77}$

(Total 2 marks)

Q13.

Jack works out the answer to $\frac{\sqrt{98.5} - 21.1}{-0.8}$

He says the answer is negative.

Is he correct?

You **must** show your working.

(Total 2 marks)

Q14.

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)

Q15.

Estimate the value of $19.4^2 + 30\sqrt{104}$

(Total 3 marks)

Q16.

By rounding each number to the nearest 10, estimate the value of 31×18

(Total 3 marks)

Q17.

By rounding each number to the nearest 10, estimate the answer to

$$\frac{78 \times 11.6}{39}$$

You **must** show your working.

(Total 3 marks)

Q18.

Freddie tries to work out $\frac{29.15 + 83.47}{9.82}$

His answer is 37.65

By rounding each number to the nearest 10, show that his answer is incorrect.

(Total 3 marks)

Q19.

Circle the number that is closest in value to $\sqrt{50}$

5

7

8

25

(Total 1 mark)

Q20.

By rounding each number to the nearest 10, estimate the value of $262 \div 19.8$

(Total 2 marks)

Q21.

The table shows the cost of a short break at a holiday park.

Holiday starts in	Adult	1st and 2nd Child	3rd and 4th Child
June	£199 each	£39 each	FREE
July	£299 each	£49 each	£19 each
August	£349 each	£59 each	£39 each

Mr and Mrs Hyde and their **three** children want a short break starting on 28 July.

(a) Use approximations to **estimate** the cost of this short break.

You **must** show your working.

(3)

(b) Work out **exactly** how much **more** it would cost if they went in August instead of July.

(2)

(Total 5 marks)

Q22.

A cinema has

37 rows of seats

23 seats in each row.

Adult tickets are £8 each.

Child tickets are £6 each.

The cinema has sold tickets for every seat.

The manager estimates that £6400 was raised from these tickets.

200 child tickets were sold.

Check whether the manager's estimate was close to the exact amount of money raised.

(Total 6 marks)

Q23.

The table shows information about grocery items.

	Small	Medium	Large
Bag of apples	–	495 grams	795 grams
Tin of fish	195 grams	285 grams	–
Packet of nuts	37 grams	57 grams	87 grams

Use approximations to estimate the **total** amount these items weigh.

2 large bags of apples

1 small tin of fish

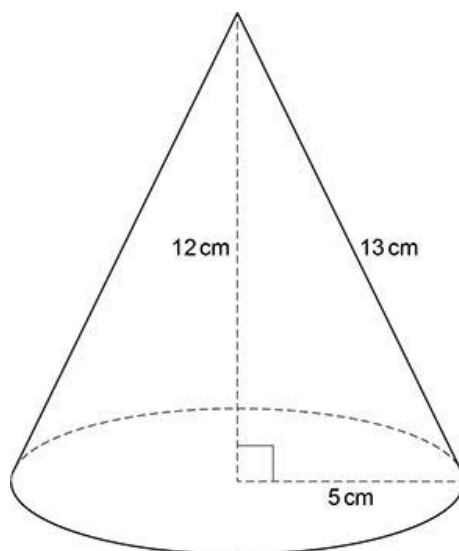
2 medium packets of nuts

You **must** show your working.

(Total 3 marks)

Q24.

Here is a cone.



(a)

Curved surface area of a cone = πrl
where r is the radius and l is the slant height

Beth tries to work out the curved surface area in terms of π

$$\begin{aligned}\text{Curved surface area of the cone} &= \pi \times 5 \times 12 \\ &= 60\pi \text{ cm}^2\end{aligned}$$

What mistake has she made?

(1)

- (b) Adam uses $\pi = 3$ to estimate the area of the **base** of the cone.
Work out his estimate.

(2)

- (c) Beth uses $\pi = 3.14$ to estimate the area of the **base** of the cone.
Is Beth's estimate more than or less than Adam's estimate?
Tick **one** box.

More than

☐

Less
than

☐

Give a reason for your answer.

(1)

(Total 4 marks)

Q25.

By rounding each number to one significant figure,

$$\frac{\sqrt{401} + 1.9^3}{\cos 58.7^\circ}$$

estimate the value of

You **must** show your working.

(Total 3 marks)

Question 26 is **higher** tier only

Q26.

Estimate the value of $101.4\frac{1}{2} + 6.43^0 \times 7.99\frac{2}{3}$

(Total 4 marks)