

Rounding, estimation and error intervals

Exam questions

Foundation and Higher tiers

Please write clearly in block capitals.

Name

Class

Teacher

Time allowed: 70 minutes

Materials

For this booklet you need a black pen, a pencil, a ruler, a rubber and a calculator for Section B.

Instructions

- Use black ink or black ballpoint pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions in the spaces provided.
- **Section A** (questions 1 to 11): you must not use a calculator.
- **Section B** (questions 12 to 25): you may use a calculator.
- Do all rough work in this booklet. Cross through any work you do not want marked.

Information

- The marks for each question are shown in brackets.
- The maximum mark for this booklet is 61.

Advice

- Read each question carefully.
- In all calculations, show clearly how you work out your answer.

For teacher's use

Q	Mark	Q	Mark
1		14	
2		15	
3		16	
4		17	
5		18	
6		19	
7		20	
8		21	
9		22	
10		23	
11		24	
12		25	
13			
TOTAL			

Section A**You must not use a calculator**Do not
write
outside
the box

- 1** The number of people at a festival was 38 457

(a) Round 38 457 to the nearest thousand.

Answer _____
[1 mark]

(b) Round 38 457 to the nearest ten.

Answer _____
[1 mark]

- 2** Circle the number that rounds to 5.3 to 1 decimal place.

5.35 5.249 5.26 5.208

[1 mark]

- 3** **(a)** Round 7.0962 to 2 decimal places.

Answer _____
[1 mark]

(b) Round 0.04738 to 2 significant figures.

Answer _____
[1 mark]

(c) Round 61 850 to 1 significant figure.

Answer _____
[1 mark]

- 4** Ahmed rounds 0.03064 to 3 significant figures.
He writes 0.031

(a) Explain the mistake Ahmed has made.

[1 mark]

(b) Round 0.03064 to 3 significant figures.

Answer _____

[1 mark]

- 5** Work out an estimate for

$$\frac{61.8 - 19.7}{0.204}$$

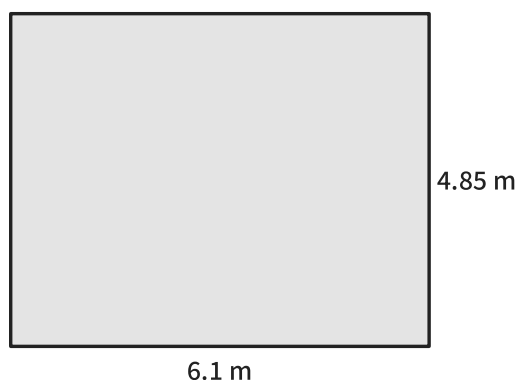
Answer _____

[2 marks]

6

The diagram shows a rectangular floor.

Tiles for the floor are sold in packs. One pack covers 0.98 m^2



Not drawn accurately

Work out an estimate for the number of packs needed to cover the floor.
You must show your working.

Answer _____

[3 marks]

7

The length of a leaf is L cm.

$L = 14.6$ correct to 1 decimal place.

Complete the error interval for L .

_____ $\leq L <$ _____

[2 marks]

Do not
write
outside
the box

8 The number of people on a train is 240, correct to the nearest 10

(a) Write down the least possible number of people on the train.

Answer _____

[1 mark]

(b) Write down the greatest possible number of people on the train.

Answer _____

[1 mark]

9 **(a)** Work out an estimate for the value of

$$6.8^2 \times \sqrt{24.6}$$

Answer _____

[2 marks]

(b) Is your answer to (a) an overestimate or an underestimate?
Give a reason for your answer.

[1 mark]

- 10** $x = 6.3$ when it is truncated to 1 decimal place.
Luis writes the error interval for x as

$$6.25 \leq x < 6.35$$

- (a)** Explain the mistake Luis has made.

[1 mark]

- (b)** Write down the correct error interval for x .

Answer _____

[1 mark]

- 11** Jack's height is 162 cm, correct to the nearest centimetre.
Ella's height is 1.6 m, correct to 1 decimal place.
Ella says,
"I could be taller than Jack."

Is Ella correct?

You must show your working.

[2 marks]

Section B



You may use a calculator

Do not
write
outside
the box

- 12** A school minibus travels 438 km on a trip.
It uses 61.7 litres of fuel.

Work out the number of kilometres it travels for each litre of fuel.
Give your answer to 1 decimal place.

Answer _____ km per litre
[2 marks]

- 13** (a) Use your calculator to work out

$$\frac{5.83^2}{2.1 + 7.46}$$

Write down all the figures on your calculator display.

Answer _____
[2 marks]

- (b) Write your answer to (a) correct to 2 significant figures.

Answer _____
[1 mark]

- 14** A machine fills 1368 bottles of water every hour.
One day the machine runs for 18.5 hours.

How many bottles does the machine fill that day?
Give your answer to the nearest thousand.

Answer _____

[2 marks]

- 15** Circle **each** calculation whose answer is 4.7 when it is rounded to 1 decimal place.

$$\sqrt{22} \quad 2.17^2 \quad \frac{33}{7} \quad 1.6^3 \quad \frac{19}{4}$$

[2 marks]

- 16** A vet gives a dog 0.18 ml of medicine for each kilogram of its mass.
Bonnie the dog has a mass of 23.6 kg.

How much medicine does the vet give Bonnie?
Give your answer to 1 decimal place.

Answer _____ ml

[2 marks]

- 17** A rectangular field is 84.6 m long and 57.3 m wide.

Work out the area of the field.
Give your answer to 3 significant figures.

Answer _____ m²

[2 marks]

- 18** Six friends win £250 in a quiz.
They share the money equally.

- (a) Work out how much each friend should get.
Give your answer to the nearest penny.

Answer £ _____

[2 marks]

- (b) Explain why the friends cannot each be given the amount in your answer to (a).

[1 mark]

- 19** Isla uses her calculator to work out

$$\frac{7.95 \times 3.86^2}{1.04}$$

She says the answer is 120, correct to 2 significant figures.

Is Isla correct?

You must show your working.

[2 marks]

- 20** Light travels about 299 792 km in one second.
Light from the Sun takes 8.3 minutes to reach the Earth.

Work out how far light travels in 8.3 minutes.
Give your answer to 3 significant figures.

Answer _____ km
[3 marks]

- 21** A film lasts 137 minutes.
Marta says,
“137 minutes is 2 hours 17 minutes, so the film lasts 2.17 hours.”

(a) Explain why Marta is wrong.

[1 mark]

(b) Write 137 minutes in hours.
Give your answer to 2 decimal places.

Answer _____ hours
[2 marks]

- 22** One sheet of paper is 0.094 mm thick.
Zainab makes a pile of 480 sheets of the paper.

Work out the height of the pile in centimetres.
Give your answer to 2 significant figures.

Answer _____ cm

[3 marks]

- 23** Kofi is staining 28 fence panels.
Each panel needs 175 ml of wood stain.
Wood stain is sold in tins that hold 1.5 litres.

(a) How many tins of wood stain does Kofi need to buy?

Answer _____

[2 marks]

(b) How much wood stain will Kofi have left over?

Answer _____ ml

[1 mark]

24

Ola buys

7 tins of paint at £3.89 each

4 brushes at £12.15 each

2 sponges at £0.98 each

- (a) Ola rounds each price to the nearest pound to estimate the total cost.
Work out her estimate.

Answer £ _____

[2 marks]

- (b) Work out the exact total cost.

Answer £ _____

[1 mark]

- (c) Is Ola's estimate more than or less than the exact total?
Give a reason why this happened.

[1 mark]

25 Kofi uses his calculator to work out

$$\frac{21.8 \times 0.396}{4.11}$$

His answer is 21.0

(a) Use estimation to show that Kofi's answer is wrong.

[2 marks]

(b) Work out the correct answer.
Give your answer to 2 decimal places.

Answer _____

[1 mark]

END OF QUESTIONS