Questions

Q1.

$p = \sqrt{\frac{2e}{f}}$

e = 6.8 correct to 1 decimal place.

f = 0.05 correct to 1 significant figure.

Work out the upper bound for the value of p.
Give your answer correct to 3 significant figures.
You must show all your working.

.....

(Total for question = 3 marks)

(**Q16 1MA1/3H, June 2022**)

Q2.

$$m = \frac{1}{ps}$$

p = 5.37 correct to 2 decimal places.
s = 2.9 correct to 1 decimal place.

Calculate the upper bound for the value for m.
You must show your working.

.....

(Total for question = 3 marks)

(**Q20 1MA1/2H/M3, Specimen papers**)

Q3.

Kiera used her calculator to work out the value of a number x.
She wrote down the first two digits of the answer on her calculator.

She wrote down 7.3

Write down the error interval for x.

.....

(Total for question = 2 marks)

(**Q08 1MA1/3H/M3, Specimen papers**)

Q4.

A number N is rounded to 2 significant figures.
The result is 7.3

(a) Write down the least possible value of N.

.....

(1)

Leila says,

"The value of N cannot be greater than 7.349 because 7.350 would round up to 7.4"

(b) Is Leila correct?
You must give a reason for your answer.

.....

.....

.....

(1)

(Total for question = 2 marks)

(**Q09 1MA1/2H, June 2024**)

Q5.

$$T = \frac{w}{a - c}$$

w = 435 correct to the nearest 5

a = 9.8 correct to 2 significant figures.

c = 2.5 correct to 2 significant figures.

By considering bounds, calculate the value of T to a suitable degree of accuracy.

You must show all your working and give a reason for your final answer.

.....

(Total for question = 5 marks)

(**Q19 1MA1/2H, Nov 2024**)

Q6.

Jana used her calculator to find the value of a number t.

The answer on her calculator began 10.2

Complete the error interval for t.

..... ≤ t < .....

(Total for question = 2 marks)

(**Q07 1MA1/3H, Nov 2024**)

Q7.

A number, d, is rounded to 1 decimal place.
The result is 12.7

Complete the error interval for d.

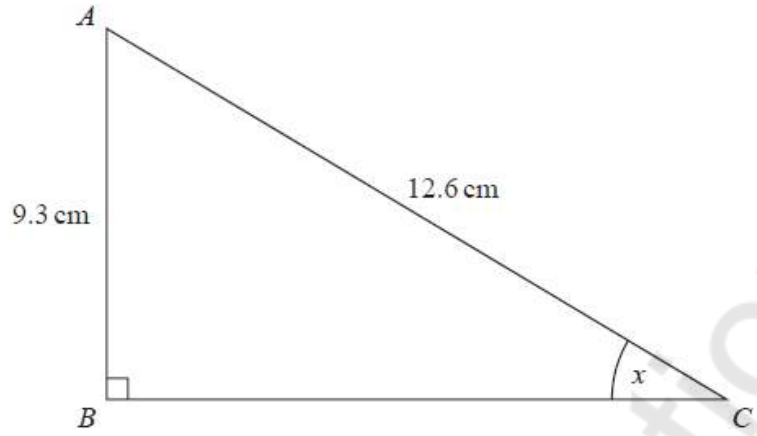
..... ≤ d < .....

(Total for question = 2 marks)

(**Q26 1MA1/2F, June 2023**)

Q8.

ABC is a right-angled triangle.



AB = 9.3 cm correct to the nearest mm.

AC = 12.6 cm correct to the nearest mm.

Calculate the lower bound for the size of the angle marked *x*.

You must show all your working.

..... °

(Total for question = 3 marks)

(**Q19 1MA1/2H, June 2023**)

Q9.

$$D = \frac{u^2}{2a}$$

u = 26.2 correct to 3 significant figures

a = 4.3 correct to 2 significant figures

(a) Calculate the upper bound for the value of D.
Give your answer correct to 6 significant figures.
You must show all your working.

.....

(3)

The lower bound for the value of D is 78.6003 correct to 6 significant figures.

(b) By considering bounds, write down the value of D to a suitable degree of accuracy.
You must give a reason for your answer.

.....

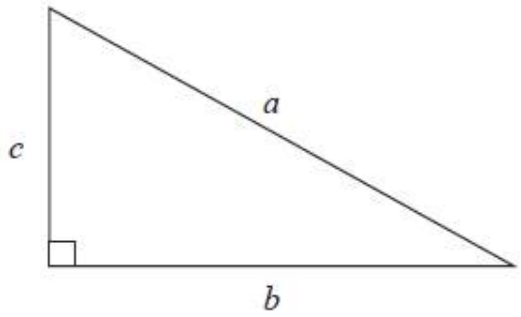
.....

(2)

(Total for question = 5 marks)

(**Q19 1MA1/3H, June 2019**)

Q10.



a is 8.3 cm correct to the nearest mm
b is 6.1 cm correct to the nearest mm

Calculate the upper bound for *c*.
You must show your working.

..... cm

(Total for question = 4 marks)

(**Q17 1MA1/2H/S2, Specimen papers**)

Q11.

A high speed train travels a distance of 487 km in 3 hours.

The distance is measured correct to the nearest kilometre.
The time is measured correct to the nearest minute.

By considering bounds, work out the average speed, in km/minute, of the train to a suitable degree of accuracy.
You must show all your working and give a reason for your answer.

..... km/minute

(Total for question = 5 marks)

(**Q18 1MA1/3H, Nov 2018**)

Q12.

A race is measured to have a distance of 10.6 km, correct to the nearest 0.1 km.
Sam runs the race in a time of 31 minutes 48 seconds, correct to the nearest second.

Sam's average speed in this race is V km/hour.

By considering bounds, calculate the value of V to a suitable degree of accuracy.
You must show all your working and give a reason for your answer.

(Total for question = 5 marks)

(**Q23 1MA1/2H, Nov 2022**)

Q13.

Harley's house has a value of £160 000 correct to 2 significant figures.

(a) (i) Write down the least possible value of the house.

£ .....

(1)

(ii) Write down the greatest possible value of the house.

£ .....

(1)

The value of Rita's house increased by 5%.
Her house then had a value of £210 000

(b) Work out the value of Rita's house before the increase.

£ .....

(2)

(Total for question = 4 marks)

(**Q23 1MA1/3F, June 2017**)

Q14.

A number, y, is rounded to 2 significant figures.

The result is 0.46

Write down the error interval for y.

.....

(Total for question = 2 marks)

(**Q23 1MA1/1F/M1, Specimen papers**)

Q15.

(a) Find the value of the reciprocal of 1.6

Give your answer as a decimal.

.....

(1)

Jess rounds a number, x, to one decimal place.
The result is 9.8

(b) Write down the error interval for x.

.....

(2)

(Total for question = 3 marks)

(**Q05 1MA1/3H, Nov 2017**)

Q16.

$$D = \frac{x}{y}$$

x = 99.7 correct to 1 decimal place.
y = 67 correct to 2 significant figures.

Work out an upper bound for D.

.....

(Total for question is 3 marks)

(**Q22 1MA1/2H/S1, Specimen papers**)

Q17.

Martin used his calculator to work out the value of a number *P*.
He wrote down the first two digits of the answer on his calculator.

He wrote down 1.2

Complete the error interval for *P*.

..... ≤ *P* < .....

(Total for question = 2 marks)

(**Q12 1MA1/3H, Nov 2022**)

Q18.

Freddie measured the length of a pencil as 7.2 cm correct to 1 decimal place.

Complete the error interval for the length, *p* cm, of the pencil.

.....≤ *p* <.....

(Total for question = 2 marks)

(**Q27 1MA1/1F, Nov 2021**)

Q19.

Freya writes down the value of x, correct to 1 decimal place.

She writes $x = 6.4$

Complete the error interval for x.

..... ≤ x < .....

(Total for question = 2 marks)

(**Q11 1MA1/3H, Nov 2021**)

Q20.

The time period, T seconds, of a simple pendulum of length l cm is given by the formula

$$T = 2\pi\sqrt{\frac{l}{g}}$$

Katie uses a simple pendulum in an experiment to find an estimate for the value of g.

Here are her results.

l = 52.0 correct to 3 significant figures.
T = 1.45 correct to 3 significant figures.

Work out the upper bound and the lower bound for the value of g.
Use π = 3.142
You must show all your working.

upper bound = ...

lower bound = ...

(Total for question = 4 marks)

(**Q21 1MA1/2H, Nov 2021**)

Q21.

(a) Find the value of the reciprocal of 0.8

.....

(1)

x = 4700 correct to 2 significant figures.

(b) Complete the error interval for x.

..... ≤ x < .....

(2)

(Total for question = 3 marks)

(**Q25 1MA1/2F, Nov 2022**)

Q22.

A train travelled along a track in 110 minutes, correct to the nearest 5 minutes.

Jake finds out that the track is 270 km long.
He assumes that the track has been measured correct to the nearest 10 km.

(a) Could the average speed of the train have been greater than 160 km/h?

You must show how you get your answer.

(4)

Jake's assumption was wrong.
The track was measured correct to the nearest 5 km.

(b) Explain how this could affect your decision in part (a).

.....

.....

.....

(1)

(Total for question = 5 marks)

(**Q17 1MA1/3H, June 2017**)

Q23.

$$m = \frac{\sqrt{s}}{t}$$

$s = 3.47$ correct to 3 significant figures

$t = 8.132$ correct to 4 significant figures

By considering bounds, work out the value of m to a suitable degree of accuracy.
Give a reason for your answer.

(Total for question = 5 marks)

(**Q18 1MA1/2H/N, Specimen papers**)

Q24.

A factory makes 450 pies every day.
The pies are chicken pies or steak pies.

Each day Milo takes a sample of 15 pies to check.

The proportion of the pies in his sample that are chicken is the same as the proportion of the pies made that day that are chicken.

On Monday Milo calculated that he needed exactly 4 chicken pies in his sample.

(a) Work out the total number of chicken pies that were made on Monday.

.....

(2)

On Tuesday, the number of steak pies Milo needs in his sample is 6 correct to the nearest whole number.

Milo takes at random a pie from the 450 pies made on Tuesday.

(b) Work out the lower bound of the probability that the pie is a steak pie.

.....

(2)

(Total for question = 4 marks)

(**Q13 1MA1/1H, Nov 2017**)

Q25.

$$R = \frac{P}{Q}$$

$P = 5.88 \times 10^8$ correct to 3 significant figures.
$Q = 3.6 \times 10^5$ correct to 2 significant figures.

Work out the lower bound for R.
Give your answer as an ordinary number correct to the nearest integer.
You must show all your working.

.....

(Total for question = 3 marks)

(**Q19 1MA1/3H, June 2024**)

Q26.

$$v = \sqrt{\frac{a}{b}}$$

a = 6.43 correct to 2 decimal places.
b = 5.514 correct to 3 decimal places.

By considering bounds, work out the value of v to a suitable degree of accuracy.
Give a reason for your answer.

.....

(Total for question = 5 marks)

(**Q16 1MA1/3H/M1, Specimen papers**)

Q27.

The petrol consumption of a car, in litres per 100 kilometres, is given by the formula

$$\text{Petrol consumption} = \frac{100 \times \text{Number of litres of petrol used}}{\text{Number of kilometres travelled}}$$

Nathan's car travelled 148 kilometres, correct to 3 significant figures.
The car used 11.8 litres of petrol, correct to 3 significant figures.

Nathan says,

"My car used less than 8 litres of petrol per 100 kilometres."

Could Nathan be wrong?
You must show how you get your answer.

(Total for question = 3 marks)

(**Q16 1MA1/3H, Nov 2017**)

Q28.

Jackson is trying to find the density, in g/cm^3, of a block of wood.
The block of wood is in the shape of a cuboid.

He measures

the length as 13.2 cm, correct to the nearest mm
the width as 16.0 cm, correct to the nearest mm
the height as 21.7 cm, correct to the nearest mm

He measures the mass as 1970 g, correct to the nearest 5 g.

By considering bounds, work out the density of the wood.
Give your answer to a suitable degree of accuracy.

You must show all your working and give a reason for your final answer.

(Total for question = 5 marks)

(**Q21 1MA1/2H, June 2018**)

Q29.

Lyn measures the length, x cm, of a piece of string as 3.5 cm correct to the nearest millimetre.

Write down the error interval for x.

.....

(Total for question = 2 marks)

(**Q20 1MA1/2F/M2, Specimen papers**)