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BI21A

21 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 21 is 5 marks)

TOTAL FOR PAPER IS 80 MARKS

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

BP17A

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 17 is 5 marks)

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16 $p = \sqrt{\frac{2e}{f}}$

$e = 6.8$ 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.

PF16A

.....

(Total for Question 16 is 3 marks)

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19 $D = \dfrac{u^2}{2a}$

KZ19A

$u = 26.2$ 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 19 is 5 marks)

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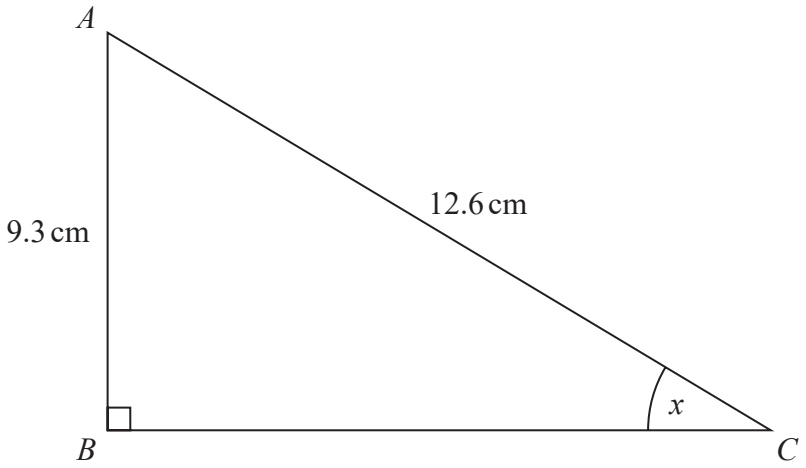
19 ABC is a right-angled triangle.



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.

PL19A

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(Total for Question 19 is 3 marks)

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PM6A

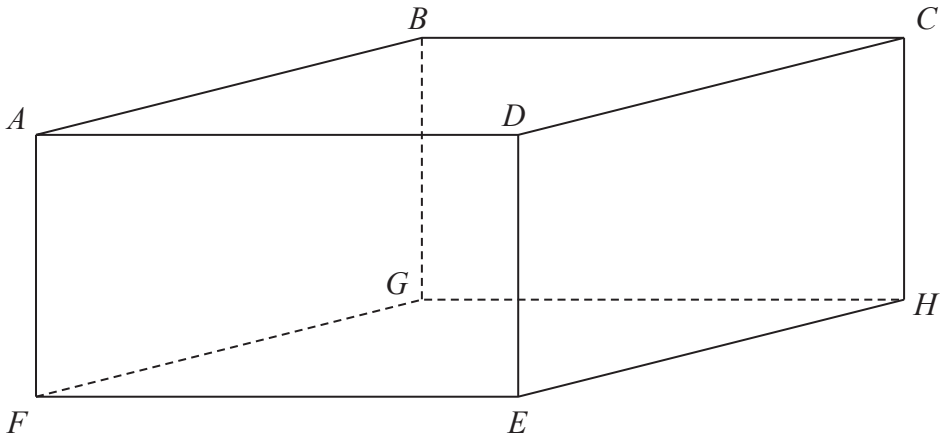
6 Lava flows from a volcano at a constant rate of 1 1.9 m^3/s

How many days does it take for 67 205 600 m^3 of lava to flow from the volcano?
Give your answer correct to the nearest day.

..... days

(Total for Question 6 is 3 marks)

20 *ABCDEFGH* is a cuboid.



$AD = 9$ cm
$FD = 13$ cm
Angle $GHF = 49°$

PH20A

Work out the size of angle FAH.
Give your answer correct to the nearest degree.

.....°

(Total for Question 20 is 4 marks)

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23 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.

PH23A

(Total for Question 23 is 5 marks)

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22 Ebony makes some bracelets to sell.

The materials to make all the bracelets cost £190, correct to the nearest £5
Ebony sells all the bracelets for a total of £875, correct to the nearest £5

The total time taken to make and sell all these bracelets was 72 hours, correct to the nearest hour.

Ebony uses this method to calculate her hourly rate of pay

$$\text{Hourly rate of pay} = \frac{\text{total selling price} - \text{total cost of materials}}{\text{total time taken}}$$

The minimum hourly rate of pay for someone of Ebony' s age is £8.20

By considering bounds, determine if Ebony's hourly rate of pay was definitely more than £8.20
You must show all your working.

(Total for Question 22 is 4 marks)

PQ22A
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18 A high speed train travels a distance of 487 km in 3 hours.

BG18A

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 18 is 5 marks)

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