

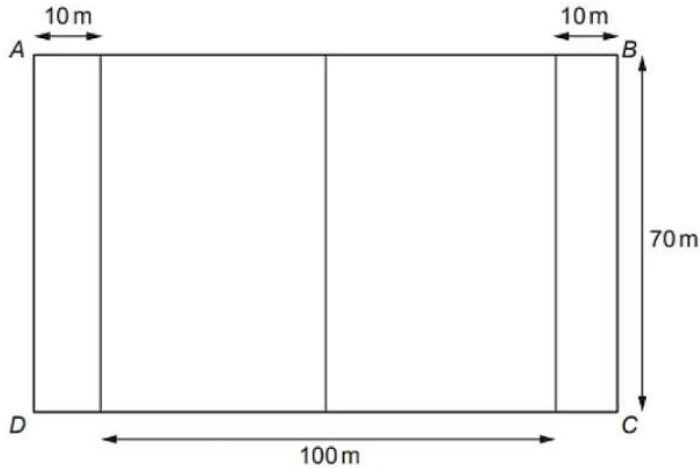
Higher Numeracy Summer 2019 P2 Q1



Wales are to play Ireland in an international rugby match.

The rugby pitch at the stadium is measured.

On the diagram below, each measurement is given **correct to the nearest 10 centimetres**.



What is the least possible length of  $AB$ ?

Give your answer in metres.

You must show all your working.

[3]

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Higher Numeracy Summer 2017 P2 Q2

Sanjay stacks three boxes in a pile.

The heights of the boxes are 25 cm, 36 cm and 47 cm.

They are all measured correct to the nearest centimetre.

What is the greatest possible height of the stack of the three boxes?

[2]

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Higher Numeracy Sample 2 P1 Q2c

(c) A kitchen worktop measures 301 cm, **correct to the nearest 1 cm**.



Derek needs to fit two of these worktops together along a wall measuring

605 cm, **correct to the nearest 5 cm**.

Unfortunately, he finds that the worktops do not fit.

Explain why this might have happened, and state the greatest possible difference between the lengths of the wall and the two worktops.

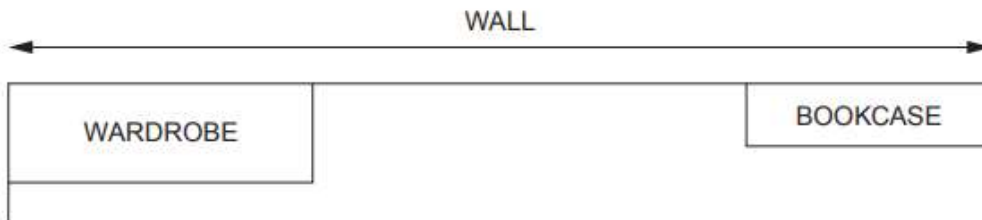
[4]

Higher Numeracy Nov 2016 P1 Q3

<p style="text-align: center;"><b>Stylish computer desk</b></p> <p style="text-align: center;">Made of laminate wood. Non-scratch top.</p> <p style="text-align: center;"><b>Length is exactly 2000mm</b></p>	
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Luc wants this new desk for his bedroom.

The desk is to fit on the straight wall between his wardrobe and his bookcase.



*Diagram not drawn to scale*

Luc has measured the length of

- the wall, which is 600 cm, correct to the nearest 10 cm,
- the bookcase, which is 147 cm, correct to the nearest 1 cm,
- the wardrobe, which is 250 cm, correct to the nearest 1 cm.

(a) What is the greatest possible length of the wall? [1]  
Circle your answer.

- 600 cm      605 cm      645 cm      610 cm      650 cm

(b) What is the least possible length of the wardrobe? [1]  
Circle your answer.

- 249 cm      249.45 cm      249.49 cm      249.5 cm      250 cm

(c) Can Luc be certain that this desk will fit in the space available?

You must

- show all your calculations,
- give the greatest or least bounds of any measurements used in calculations or comparisons,
- give a reason for your answer. [5]

Higher Numeracy Summer 2018 P1 Q5

Michelle owns a café.  
She stacks coffee mugs as shown in the diagram below.

Michelle measures the height of each coffee mug as 12 cm, correct to the nearest centimetre.  
Each stacked coffee mug creates 4 cm extra height, correct to the nearest centimetre.

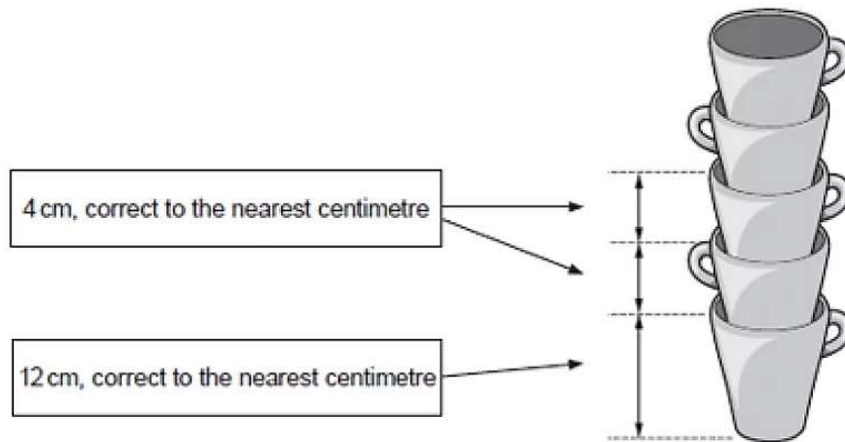


Diagram not drawn to scale

Michelle knows that the vertical height between two shelves is exactly 39 cm, as shown below.

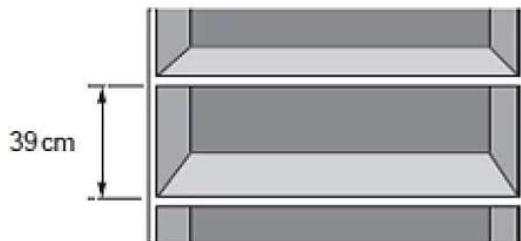


Diagram not drawn to scale

Can Michelle be certain that she will be able to place one stack of 7 coffee mugs between the two shelves?

Give a reason for your answer.  
You must show all your working.

[5]

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Higher Numeracy Nov 2016 P2 Q7

Here is some information from a 2014 geographical journal:

- Population of the UK:  $6.5 \times 10^7$ , correct to the nearest 1 000 000
- Area of the UK: 244 000 km<sup>2</sup>, correct to the nearest 1000 km<sup>2</sup>

Using these figures, calculate the greatest possible value for the population density of the UK, in population per km<sup>2</sup>. [4]

Higher Maths Summer 2019 P1 Q7a

- (a) (i) A mass is written as 430 kg, correct to the nearest 10 kg.  
Circle the **least** possible value of this mass. [1]

420 kg      425 kg      429.5 kg      426 kg      424.9 kg

- (ii) A time period is written as 22 seconds, correct to the nearest second.  
Circle the **least** possible value of this time period. [1]

22 s      20 s      21 s      21.5 s      21.4 s

- (iii) A population is written as 85 people, correct to the nearest five people.  
Circle the **least** possible value of this population. [1]

83 people      81 people      84 people      82 people      80 people

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Higher Numeracy Sam 1 P2 Q7b

- (b) Another of the cardboard boxes made by *Pack4* is a cuboid.  
The cuboid measures 3.4 cm by 2.6 cm by 6.8 cm, where all measurements are correct to the nearest 1 mm.  
By what percentage does the greatest possible volume of this cuboid exceed the least possible volume? [5]
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Higher Maths Sample 2 P2 Q9

9. You will be assessed on the quality of your organisation, communication and accuracy in writing in this question.

Gerallt ran the 400 m race in an Urdd sports event. This distance was measured correct to the nearest 0.5 m.

The time it took him was 74 seconds, measured correct to the nearest second.

Calculate Gerallt's least possible average speed **and** greatest possible average speed.

Give your answers to 3 significant figures.

You must show your working.

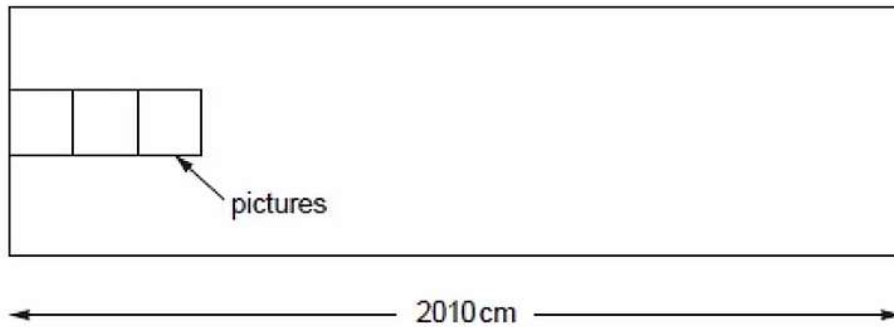
[5 + OCW 2]

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Higher Numeracy Summer 2018 P2 Q8

The Headteacher of Ysgol Castell Gwyn wants to display pictures, drawn by pupils, along one side of a corridor.

The pictures are to be in one row with no gaps between them, as shown in the diagram below.



*Diagram not drawn to scale*

The pictures are all square, with sides of length 15 cm, correct to the nearest 0.5 cm.  
The length of the corridor wall is 2010 cm, correct to the nearest 10 cm.

Calculate the smallest number of pictures and the greatest number of pictures that can be fitted in the row. [5]

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Higher Maths Nov 2016 P2 Q11

A rectangle measures 38 cm by 26 cm.  
Each measurement is correct to the nearest cm.  
Calculate the least possible area of the rectangle. [2]

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Higher Maths Nov 2017 P2 Q12

The area of a rectangle is  $137 \text{ cm}^2$ , correct to the nearest  $\text{cm}^2$ .  
Its width is 11 cm, correct to the nearest cm.

Calculate the greatest possible length of the rectangle.  
Give your answer correct to 3 significant figures. [2]

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Higher Numeracy Nov 2018 P1 Q11

A group of pupils are taking turns to ride a zip wire.

Aled models the time it takes each rider to travel sections of the zip wire.

He uses the formula

$$t = \frac{2s}{u+v}$$



where:

- $t$  is the time taken, in seconds,
- $s$  is the distance travelled, in metres,
- $u$  is the starting velocity, in metres per second ( $\text{ms}^{-1}$ ),
- $v$  is the final velocity, in metres per second ( $\text{ms}^{-1}$ ).

- (a) Vrishank is the first pupil to ride the zip wire.  
The following values were recorded for a section of his ride:

- $s = 195 \text{ m}$ , measured correct to the nearest 5 m,
- $u = 5 \text{ ms}^{-1}$ , measured correct to the nearest  $\text{ms}^{-1}$ ,
- $v = 14 \text{ ms}^{-1}$ , measured correct to the nearest  $\text{ms}^{-1}$ .

Using Aled's model, calculate the least possible time it could have taken Vrishank to travel this section of the zip wire. [4]

- (b) Mari is the second pupil to ride the zip wire.  
Values for a section of Mari's ride were recorded:

- $u = 8 \text{ ms}^{-1}$ , measured correct to the nearest  $\text{ms}^{-1}$ ,
- $v = 21 \text{ ms}^{-1}$ , measured correct to the nearest  $\text{ms}^{-1}$ ,
- $t = 14 \text{ s}$ , measured correct to the nearest second.

Using Aled's model, calculate the greatest possible distance that Mari could have travelled in this section of her ride. [4]

Higher Numeracy Summer 2019 P1 Q9

The voltage,  $V$  volts, of an electric circuit is given by the formula

$$V = IR,$$

where  $I$  is the current measured in amps, and  $R$  is the resistance measured in ohms.

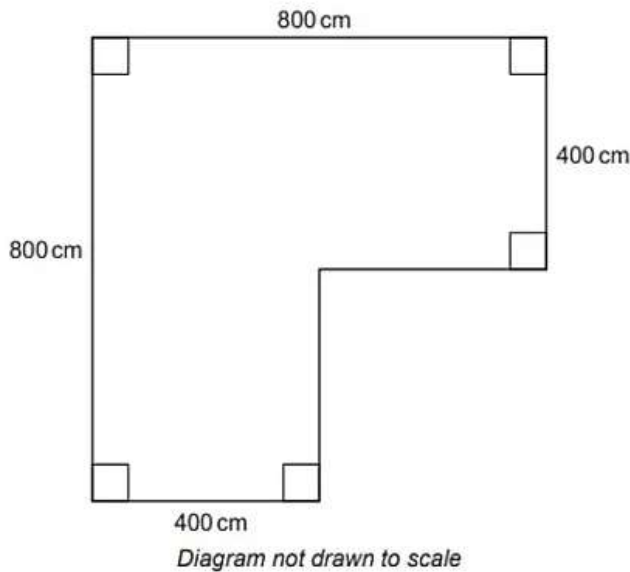
During an experiment,

- $V$  was measured at 280 volts, correct to the nearest 10 volts,
- $I$  was measured at 0.2 amps, correct to the nearest 0.1 amps.

Calculate the least possible value and greatest possible value of the resistance  $R$ . [6]

Higher Numeracy Summer 2017 P2 Q12

A plan view of Lowri's garden is shown below.



All the measurements are correct to the nearest 10 cm.

- (a) Calculate the greatest possible area of Lowri's garden. [4]
  
- (b) Lowri plans to spread grass seed over her garden using a spreading tool. Over **each square metre**, the spreading tool spreads 30 g of grass seed, correct to the nearest 5g.  
  
Lowri has exactly 1.5 kg of grass seed.  
Can she be **certain** that she has enough grass seed?  
You must show all your calculations. [3]

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Higher Maths Summer 2018 P2 Q13

The values  $a = 27$ ,  $b = 1.9$  and  $c = 0.81$  are each correct to 2 significant figures.

Use the formula  $d = \frac{a-b}{c}$  to calculate the **least** value of  $d$ .

You must show all your working. [3]

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Higher Maths Summer 2019 P2 Q13

A car travels 300 km, measured correct to the nearest 5 km.

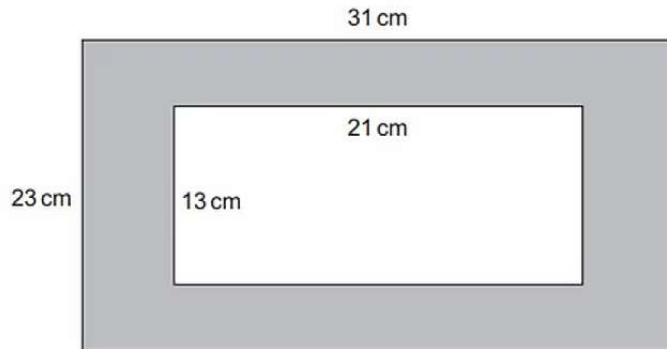
It travels this distance in 6 hours, measured correct to the nearest hour.

Calculate the least possible average speed of the car.

Give your answer in km/h, correct to 2 decimal places. [3]

Higher Maths June 2017 P2 Q14

The region between two rectangles is shaded, as shown in the diagram below.  
All of the measurements shown are given **correct to the nearest cm**.



*Diagram not drawn to scale*

Calculate the greatest possible area of the shaded region.

[3]