



SCAN ME

# Upper and Lower Bounds



SCAN ME

← REVISE THIS TOPIC

CHECK YOUR ANSWERS →

1 To the nearest pound, Eric has £8.00  
To the nearest 10p, Nicky has £1.60

1 (a) Work out the maximum possible total amount of money. [3 marks]

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Answer £ \_\_\_\_\_

1 (b) Eric buys a new phone case.  
The phone case costs £2.50 (to the nearest 50p).

Work out the maximum amount of money that Eric could have left after buying the phone case. [3 marks]

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Answer £ \_\_\_\_\_



2 To 2 significant figures, the capacity of a can of drink is 330 ml  
A multipack contains 24 cans of drink.

2 (a) Work out the upper bound for the capacity of the multipack of cans. [2 marks]

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Answer \_\_\_\_\_ ml

2 (b) Work out the lower bound for the capacity of the multipack of cans. [2 marks]

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Answer \_\_\_\_\_ ml

2 (c) Arya opens one of the cans of drink.  
She drinks 72 ml (to the nearest ml) of the drink.

Work out the lower bound for the amount of drink that could be left in the can. [3 marks]

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Answer \_\_\_\_\_ ml





3 A stadium contains 32000 fans (to 2 significant figures).  
On average, each fan spends £3.50 (to the nearest 50p) at the stadium.

3 (a) Work out the upper bound for the total amount of money spent. [3 marks]

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Answer £ \_\_\_\_\_

3 (b) Work out the lower bound for the total amount of money spent. [2 marks]

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Answer £ \_\_\_\_\_

3 (c) At half time 30% (to the nearest 10%) of the fans leave the stadium.  
Work out the lower bound for the number of fans that leave the stadium. [2 marks]

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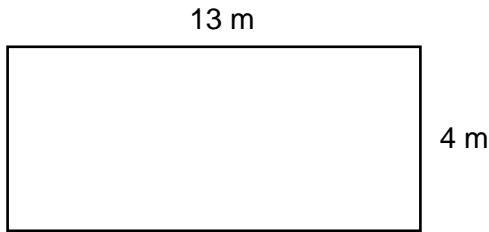
Answer \_\_\_\_\_

Turn over ►





4 The dimensions of a rectangle are shown to the nearest metre.



4 (a) Work out the upper bound for the **area** of the rectangle. [3 marks]

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Answer \_\_\_\_\_ m<sup>2</sup>

4 (b) Work out the lower bound for the **perimeter** of the rectangle. [2 marks]

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Answer \_\_\_\_\_ m





5 To 1 decimal place, the radius of a circle is 6.5 cm

5 (a) Work out the lower bound for the area of the circle. [2 marks]

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Answer \_\_\_\_\_ cm<sup>2</sup>

5 (b) Work out the upper bound for the circumference of the circle. [2 marks]

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Answer \_\_\_\_\_ cm

6  $x = 700$  (to 1 significant figure)  
 $y = 84$  (to the nearest integer)

Work out the upper bound for  $2x + y$  [2 marks]

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Answer \_\_\_\_\_

12

Turn over ►





7 Jacob invest £600 (to 1 significant figure) in a bank for 4 years.  
The bank pays compound interest at 3.2% (to 1 decimal place).

Work out the upper and lower bound for the total amount of money Jacob has in his account after 4 years. **[4 marks]**

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Upper Bound £ \_\_\_\_\_

Lower Bound £ \_\_\_\_\_

8 The interior angle of a regular polygon is  $150^\circ$  (correct to 2 significant figures).  
Work out the maximum and minimum number of sides of the regular polygon.

**[4 marks]**

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Maximum \_\_\_\_\_

Minimum \_\_\_\_\_





- 9 Box A has a mass of 800 kg (to the nearest 100 kg)  
Box B has a mass of 600 kg (to the nearest 100 kg)  
Box C has a mass of 1500 kg (to the nearest 100 kg)

A lorry can safely carry a load of 3 tonnes.

Can all three boxes be carried safely in the lorry?

Tick **one** box.

Yes

No

Not possible to tell

Show working to support your answer.

[1 tonne = 1000 kg]

[4 marks]

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- 10  $p = 3.9$  (to 1 decimal place)  
 $q = 0.33$  (to 2 decimal places)

Work out the lower bound for  $\frac{p^2}{q}$  giving your answer to 6 significant figures.

[3 marks]

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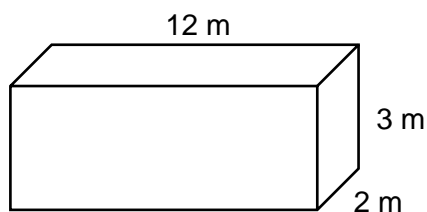
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Answer \_\_\_\_\_

Turn over ►



- 11 The dimensions of a cuboid are shown to the nearest metre.



The outside surfaces of the cuboid are to be painted.  
Each tin of paint covers  $28 \text{ m}^2$  (to the nearest square metre).

Show clearly that 6 tins of paint may not be enough to paint the outside surfaces. **[4 marks]**

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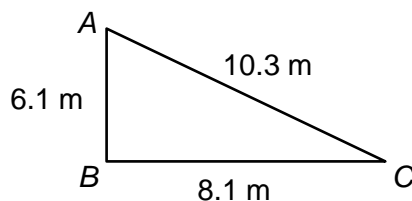
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- 12 The dimensions of a triangle are shown to the nearest 0.1 m



Show clearly that angle  $ABC$  cannot be a right angle. **[4 marks]**

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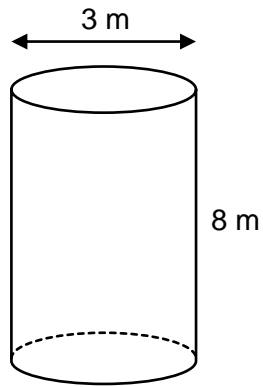
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- 13 The dimensions of a cylinder are shown to the nearest metre.



$$\text{pressure} = \frac{\text{force}}{\text{area}}$$

The cylinder exerts a force of  $8 \times 10^5$  Newtons (to 1 significant figure) onto a floor.

Calculate the lower bound for the pressure between the cylinder and the floor.  
Give your answer to 5 significant figures.

[5 marks]

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Answer \_\_\_\_\_ N/m<sup>2</sup>

Turn over ►





14

- $a = 400$  (to 1 significant figure)
- $b = 320$  (to 2 significant figures)
- $c = 1.1$  (to 1 decimal place)

Work out the upper bound for  $\sqrt{\frac{a-b}{c}}$

Give your answer to 3 decimal places.

[4 marks]

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Answer \_\_\_\_\_

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- $m = 3.8$  (to 1 decimal place)
- $n = 7$  (to the nearest integer)
- $h = 0.43$  (to 2 decimal places)

Work out the lower bound for  $\frac{m+n}{6-h}$

Give your answer to 3 decimal places.

[4 marks]

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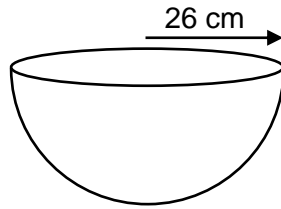
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Answer \_\_\_\_\_



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A container is in the shape of a hemisphere  
The radius of the hemisphere is 26 cm (to the nearest centimetre).



Liquid fills the hemisphere at a constant rate.  
The constant rate = 550 ml (to the nearest 50 ml) per minute.

Show that it takes at least 1 hour to fill the hemisphere.

[5 marks]

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