19. To the nearest centimetre, $x = 4\,\text{cm}$ and $y = 6\,\text{cm}$.

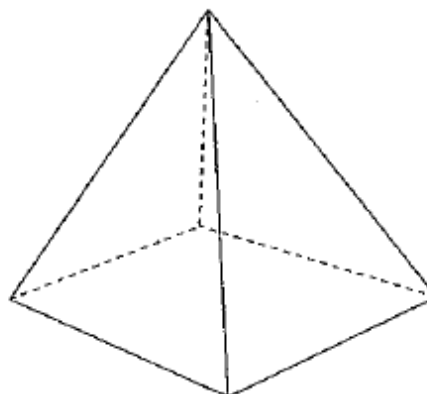   (a) Calculate the upper bound for the value of xy

....

(2)

    (b) Calculate the lower bound for the value of $\dfrac{x}{y}$

        Give your answer correct to 3 significant figures.

....

(3)

20.

The pyramid Cheops in Egypt is a square based pyramid.
The length of a side of the square base is 230 metres.
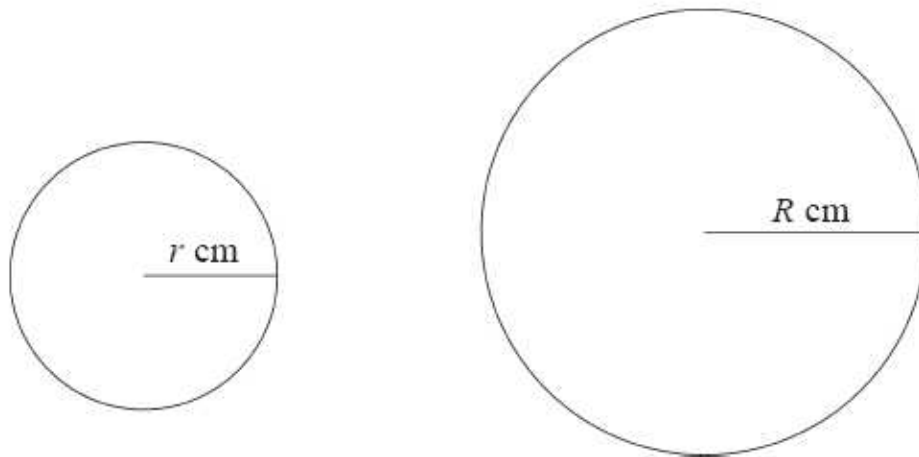The vertical height of the pyramid is 146 metres.

Both measurements are correct to the nearest metre.

    (a) Calculate the difference between the upper bound and the lower bound of the volume of the pyramid.
        Give your answer correct to 3 significant figures.

16.

The diagram represents two metal spheres of different sizes.

The radius of the smaller sphere is r cm.
The radius of the larger sphere is R cm.

$r = 1.7$ correct to 1 decimal place.

$R = 31.0$ correct to 3 significant figures.

(a) Write down the upper and lower bounds of r and R.

Upper bound of $r =$ ....

Lower bound of $r =$ ....

Upper bound of $R =$ ....

Lower bound of $R =$ ....

(2)

(b) Find the smallest possible value of $R-r$.

....

(1)

The larger sphere of radius R cm was melted down and used to make smaller spheres of radius r cm.

(c) Calculate the smallest possible number of spheres that could be made.

....

(4)

19. Bill has a rectangular sheet of metal.
The length of the rectangle is **exactly** 12.5 cm.
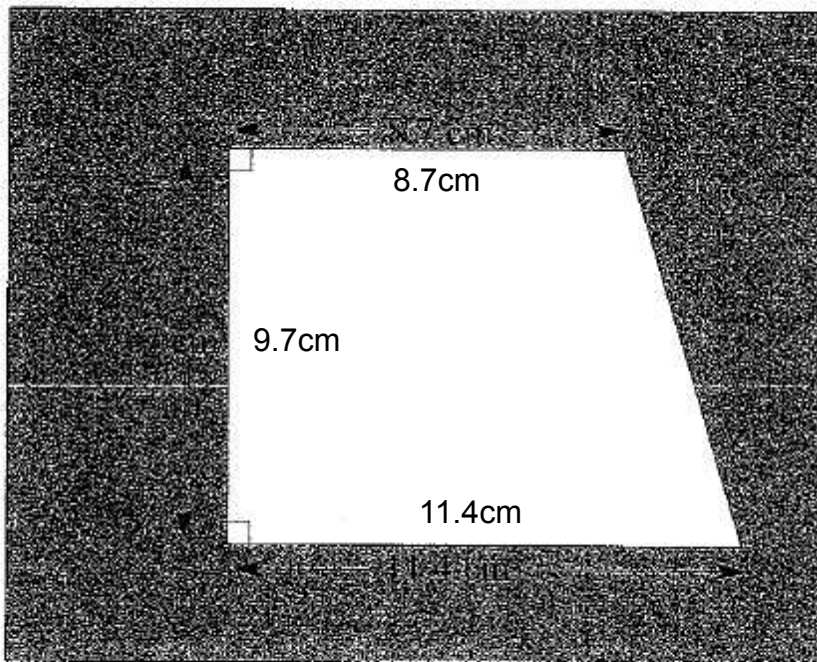The width of the rectangle is **exactly** 10 cm.

Diagram **NOT** accurately drawn.

8.7cm

9.7cm

11.4cm

Bill cuts out a trapezium.
Its dimensions, shown in the diagram, are correct to the nearest millimetre.
He throws away the rest of the metal sheet.

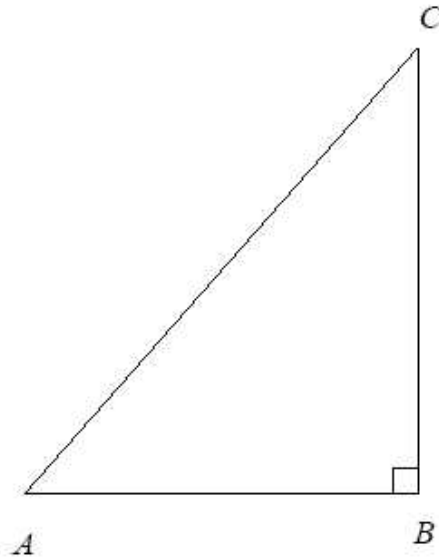Calculate the **greatest** possible area of the rectangular sheet that he throws away.

18.

C

Diagram **NOT** accurately drawn

A   B

The diagram shows a triangle *ABC*.
Angle *ABC* is **exactly** 90°.
AB = 83 mm correct to 2 significant figures.
BC = 90 mm correct to 1 significant figures.

(a)   Calculate the upper bound for the area of triangle *ABC*.

……………….. mm^2

(2)

Angle *CAB* = $x°$.

(b)   Calculate the lower bound for the value of tan $x°$.

………………………..

(2)

ABC is the cross section of a triangular prism.

The upper bound for the volume of the prism is 51561.25 mm^3.
The lower bound for the volume of the prism is 45581.25 mm^3.

(d)   Write down the volume of the prism, in cm^3, to an appropriate
        degree of accuracy.

……………… cm^3

(2)

(Total 6 marks)

9.
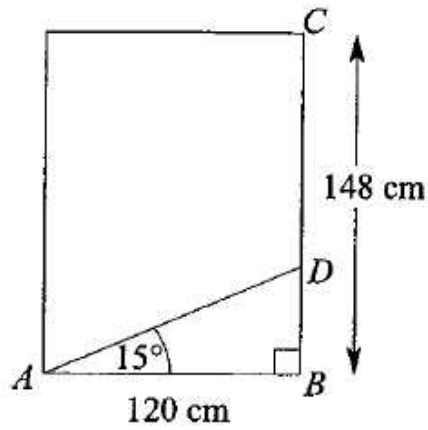
Diagram **NOT**
accurately drawn.

148 cm

120 cm

AB and *BC* are two sides of a rectangle.
AB = 120 cm and *BC* = 148 cm.
D is a point on *BC*.
Angle *BAD* = 15°.

(*a*) Work out the length of *CD*.
Give your answer correct to the nearest centimetre.

.... cm
(4 marks)

148 is correct to 3 significant figures.
120 is correct to 3 significant figures.
15 is correct to the nearest whole number.

(*b*) Write down the three values which should be used to work out the lower bound for the length of *CD*.

.... , ... , ...
(3 marks)