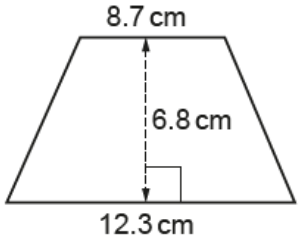
Mensuration – 2021/20 GCSE Mathematics Higher

1. Nov/2021/Paper_J560/04/No.2

Calculate the area of this trapezium.

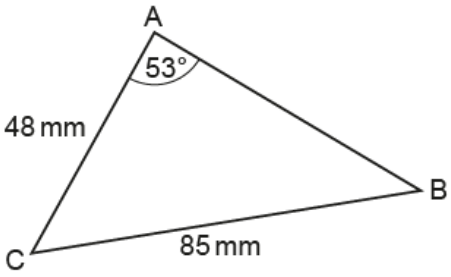


Not to scale

..... cm^2 **[2]**

2. Nov/2021/Paper_J560/04/No.17

The diagram shows triangle ABC.



Not to scale

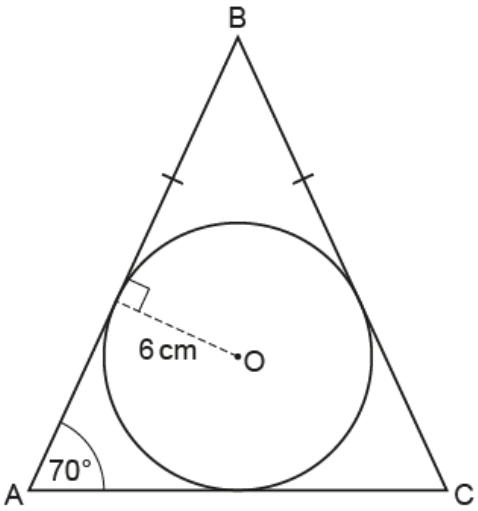
AC = 48 mm, BC = 85 mm and angle BAC = 53°.

Calculate length AB.
You must show your working.

..... mm **[6]**

3. Nov/2021/Paper_J560/04/No.19

ABC is an isosceles triangle.
The sides of the triangle ABC are all tangents to a circle of radius 6 cm, centre O.



Not to scale

Angle BAC = 70° and BA = BC.

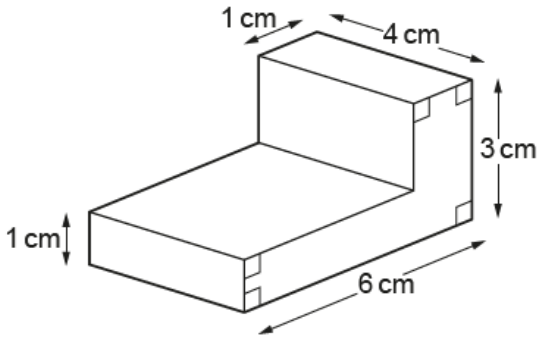
(a) Show that length BO is 17.54 cm, correct to **2** decimal places. **[4]**

(b) Find the area of triangle ABC.
You must show your working.

..... cm^2 **[5]**

4. Nov/2021/Paper_J560/05/No.5

Work out the volume of this prism.



Not to scale

..... cm^3 **[4]**

5. Nov/2021/Paper_J560/05/No.10

Force is measured in newtons (N).
A force of 198.5 N is applied to a rectangular surface of length 4.9 cm and width 4.1 cm.

Work out an **estimate** of the pressure, in N/cm^2, applied to this rectangular surface.

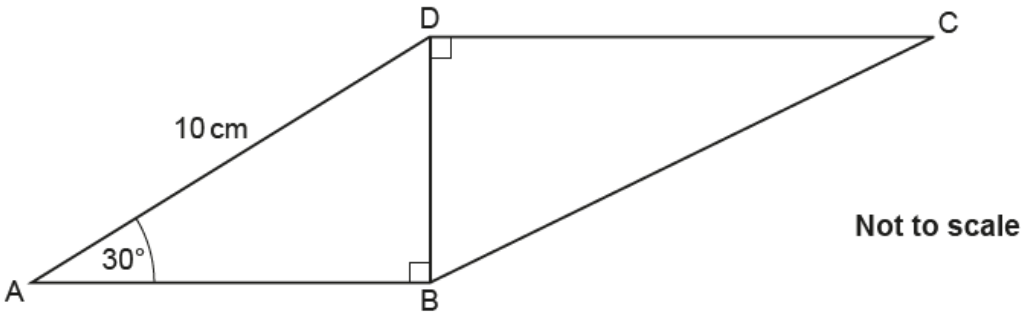
[The formula for pressure is: Pressure $= \frac{\text{Force}}{\text{Area}}$]

..... N/cm^2 **[4]**

6. Nov/2021/Paper_J560/05/No.11

The diagram shows a quadrilateral ABCD.

AD = 10 cm, angle BAD = 30° and angle ABD = angle BDC = 90°.



Not to scale

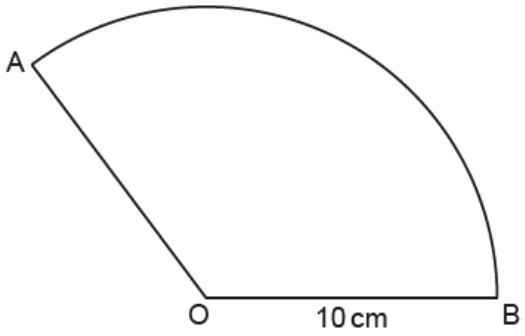
The ratio of length BD to length DC is 1 : 2.4 .

Work out length BC.
You must show your working.

..... cm **[7]**

7. Nov/2021/Paper_J560/05/No.21

AOB is a sector of a circle, centre O and radius 10 cm.



Not to scale

The area of the sector is 40π cm^2.

Work out the perimeter of the sector.
Give your answer in the form $a + b\pi$, where a and b are integers.
You must show your working.

..... cm **[6]**

8. Nov/2021/Paper_J560/06/No.12

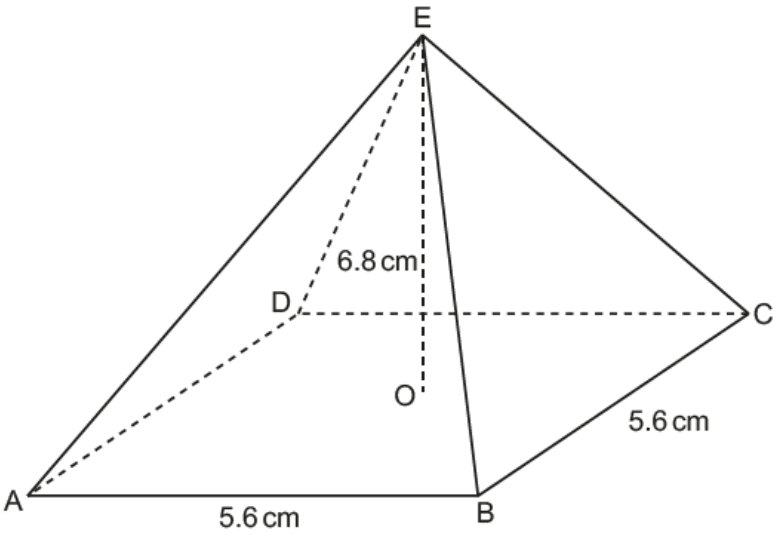
A solid metal sphere has mass 235 g.
The density of the metal is 7.78 g/cm^3.

Show that the surface area of this sphere is 46.9 cm^2, correct to **3** significant figures.
You must show your working.

[For a sphere with radius r: Volume $= \frac{4}{3}\pi r^3$ Surface area $= 4\pi r^2$.] **[6]**

9. Nov/2021/Paper_J560/06/No.17

The diagram shows a pyramid ABCDE.



Not to scale

The pyramid has a square horizontal base ABCD with side 5.6 cm.

The vertex E is vertically above the centre O of the base.
The height OE of the pyramid is 6.8 cm.

Calculate the surface area of the pyramid.
You must show your working.

..... cm^2 **[5]**

10. Nov/2020/Paper_J560/04/No.6

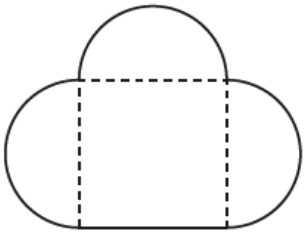
A cuboid measures 6 cm by 8 cm by 15 cm.
A cube has the same volume as the cuboid.

Find the surface area of the cube, giving your answer correct to 3 significant figures.

..... cm^2 **[4]**

11. Nov/2020/Paper_J560/04/No.10

The diagram shows Jane's lawn.
It is in the shape of a square of side 36 m and three semi-circles.



Not to scale

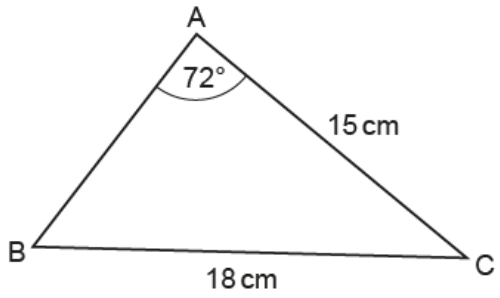
She is going to spread fertiliser on the lawn at a rate of 30 g per square metre.
The fertiliser is only sold in 10 kg bags costing £15.80 each.

Calculate the cost of buying the bags of fertiliser for her lawn.
You must show all your working.

£ ..... **[6]**

12. Nov/2020/Paper_J560/04/No.14

The diagram shows triangle ABC.



Not to scale

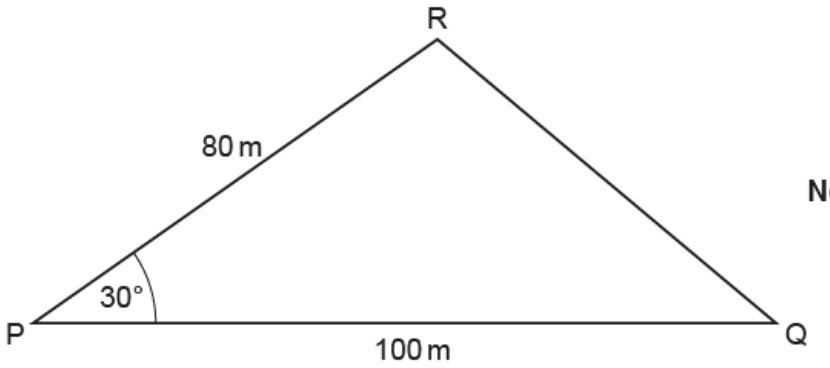
AC = 15 cm, BC = 18 cm and angle BAC = 72°.

Calculate length AB, giving your answer correct to 3 significant figures.
Show your working.

..... cm **[6]**

13. Nov/2020/Paper_J560/05/No.18

The diagram shows a triangular field PQR which is used to grow organic carrots.



Not to scale

PQ = 100 m, PR = 80 m and angle RPQ = 30°.

In recent years, an average of 2.5 kg of carrots has been harvested from each square metre of the field.

(a) Use this information to work out the total mass of carrots that might have been harvested from the field in 2019.

(a) .....kg **[4]**

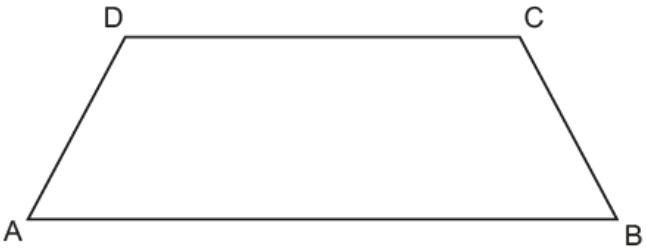
(b) Why might the answer to part **(a)** be unreliable?

.....

..... **[1]**

14. Nov/2020/Paper_J560/05/No.20

ABCD is a trapezium.



Not to scale

The perimeter of the trapezium is 56 cm.
The ratio AD : AB : DC : BC = 5 : 12 : 6 : 5.

Calculate the area of the trapezium.
Show your working.

..... cm^2 **[7]**

15. Nov/2020/Paper_J560/06/No.6

A truck is used to transport some wood panels.
Each wood panel is a cuboid measuring 2.4 m by 1.2 m by 1.8 **cm**.
The density of each wood panel is 750 kg/m^3.

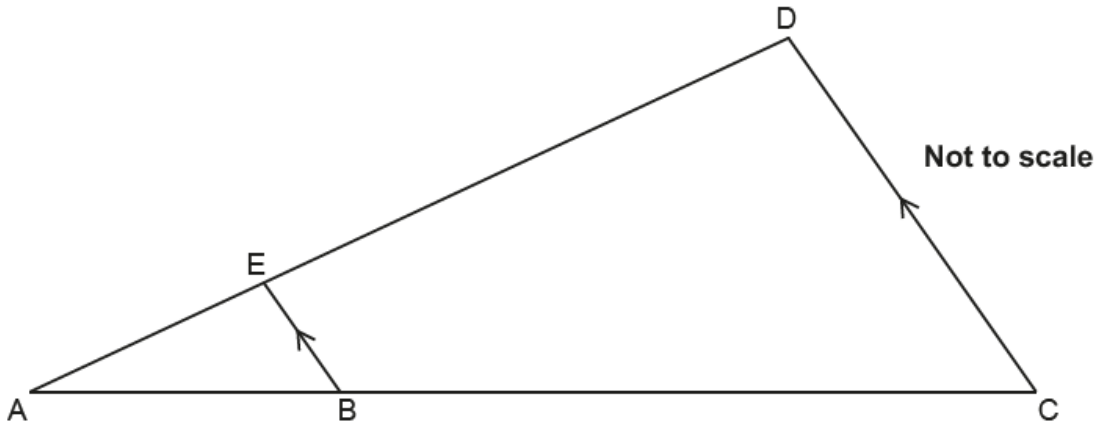
The truck can carry 15 tonnes of these wood panels.

Calculate the maximum number of wood panels that the truck can carry.
Show how you decide.

..... **[6]**

16. Nov/2020/Paper_J560/06/No.13

In the diagram, AED and ABC are straight lines and BE is parallel to CD.



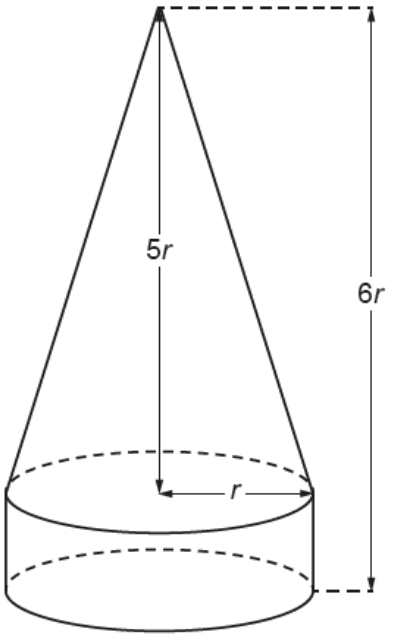
The ratio of length AB to length BC is 2 : 3.
Triangle ABE has an area of $8\,cm^2$.

Work out the area of triangle ACD.

..... cm^2 **[4]**

17. Nov/2020/Paper_J560/06/No.14

The base of a cone is fixed to the top of a cylinder to make a decoration.



The radius of the base of the cone and of the cylinder is r cm.
The cone's height is $5r$ cm.
The total height of the decoration is $6r$ cm.
The total volume of the decoration is $225\,\text{cm}^3$.

Calculate the value of r.
Show your working.

[The volume V of a cone with radius r and height h is $V = \frac{1}{3}\pi r^2 h$.]

$r =$ ..... **[5]**