3D Pythagoras & Trigonometry

Question Paper 4

Level	IGCSE
Subject	Maths (0580)
Exam Board	Cambridge International Examinations (CIE)
Paper Type	Extended
Topic	Trigonometry
Sub-Topic	3D Pythagoras & Trigonometry
Booklet	Question Paper 4

Time Allowed: **35 minutes**

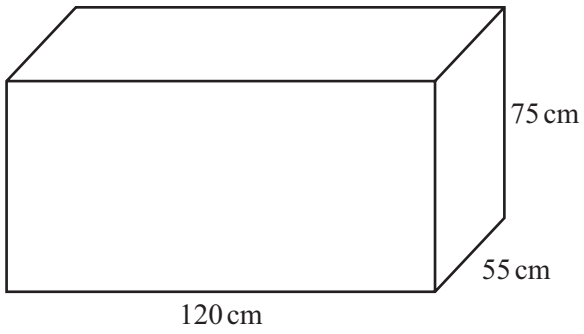
Score: **/29**

Percentage: **/100**

Grade Boundaries:

A*	A	B	C	D	E	U
>85%	75%	60%	45%	35%	25%	<25%

1



NOT TO SCALE

The diagram shows a water tank in the shape of a cuboid measuring 120 cm by 55 cm by 75 cm.
The tank is filled completely with water.

(a) Show that the capacity of the water tank is 495 litres.

Answer(a)

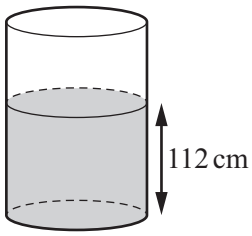
[2]

(b) The water from the tank flows into an empty cylinder at a uniform rate of 750 millilitres per second.

Calculate the length of time, in minutes, for the water to be completely emptied from the tank.

Answer(b)(i) ..... min [2]

(ii) When the tank is completely empty, the height of the water in the cylinder is 112 cm.

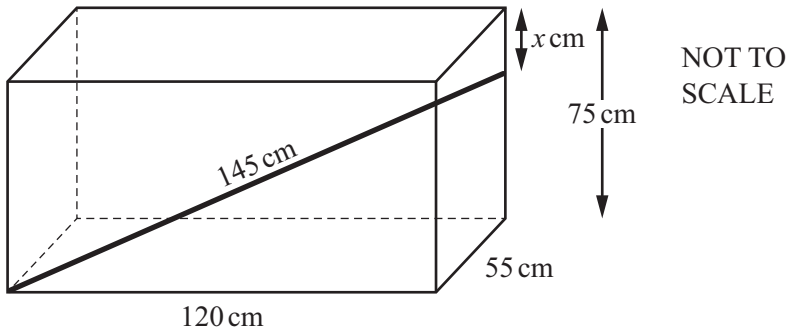


NOT TO SCALE

Calculate the radius of the cylinder.

Answer(b)(ii) ..... cm [3]

(c)



A rod of length 145 cm is placed inside the water tank.
One end of the rod is in the bottom corner of the tank as shown.
The other end of the rod is x cm below the top corner of the tank as shown.

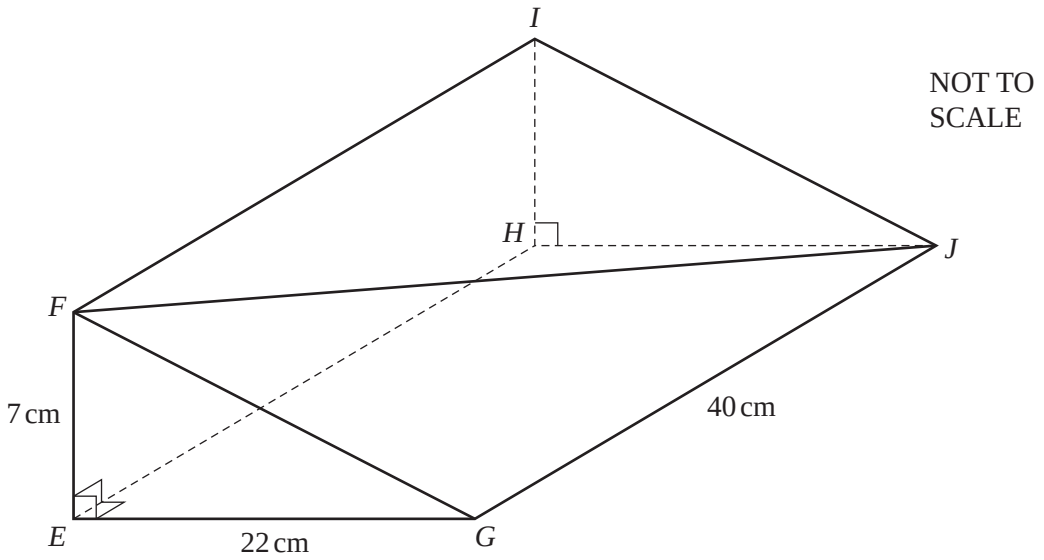
Calculate the value of x.

Answer(c) $x =$ ..... [4]

(d) Calculate the angle that the rod makes with the base of the tank.

Answer(d) ..... [3]

2



EFGHIJ is a solid metal prism of length 40 cm.
The cross section *EFG* is a right-angled triangle.
EF = 7 cm and *EG* = 22 cm.

(a) Calculate the volume of the prism.

Answer(a) ..... cm^3 [2]

(b) Calculate the length *FJ*.

Answer(b) FJ = ... cm [4]

(c) Calculate the angle between FJ and the base $EGJH$ of the prism.

Answer(c) ..... [3]

(d) The prism is melted and made into spheres.
Each sphere has a radius 1.5 cm.

Work out the greatest number of spheres that can be made.

[The volume, V, of a sphere with radius r is $V = \frac{4}{3}\pi r^3$.]

Answer(d) ..... [3]

(e) A right-angled triangle is the cross section of another prism.
This triangle has height 4.5 cm and base 11.0 cm.
Both measurements are correct to 1 decimal place.

Calculate the upper bound for the area of this triangle.

Answer(e)(i) ..... cm^2 [2]

(ii) Write your answer to **part (e)(i)** correct to 4 significant figures.

Answer(e)(ii) ..... cm^2 [1]