

Higher Numeracy Nov 2016 P2 Q8

A confectionary company is designing a new chocolate-covered biscuit in the shape of a square-based pyramid.

The centre of the square base is labelled O .

Each biscuit will have base sides of length 3.4 cm , and a vertical height of 2.1 cm .

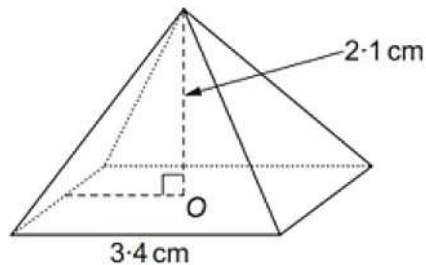


Diagram not drawn to scale

- (a) Calculate the angle that one of the triangular faces makes with the base of the pyramid. [4]
- (b) The company knows that it costs 0.08p per cm^2 to apply a chocolate covering. Calculate the cost of applying a chocolate covering to all 5 faces of a biscuit. [6]

Higher Numeracy Nov 2017 P2 Q8

A baker makes cake slices to sell in her shop.

All of the cake slices are identical. They have been cut from a cylindrical cake of radius 10 cm and depth 4 cm .

Piped icing is placed on the curved surface of each cake slice, as shown in the diagram.

It connects opposite vertices of this curved surface, and follows the shortest path between these vertices.

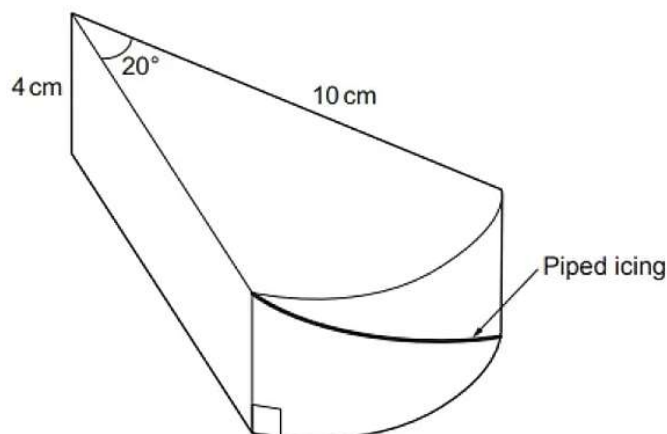


Diagram not drawn to scale

What length of piped icing will be needed to decorate all the slices that make up a whole cylindrical cake? [7]

Higher Numeracy Summer 2019 P1 Q10

A tent company is designing a new 2-person tent.

The base of the tent is in the shape of a kite, as shown below.

The width of the kite is 160 cm, and the two shorter sides are of length 100 cm.

The point where the diagonals of the kite intersect has been marked O on the diagram below.

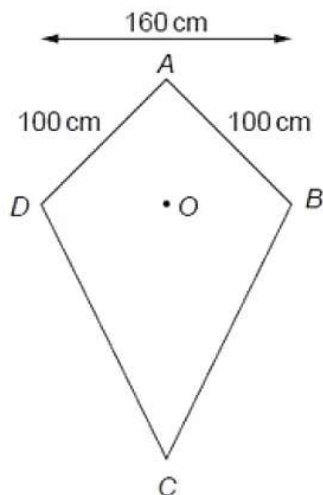


Diagram not drawn to scale

E is the highest point of the tent, and is 110 cm vertically above O .

Part of the frame that supports the tent cover is a straight pole that goes from A to E .

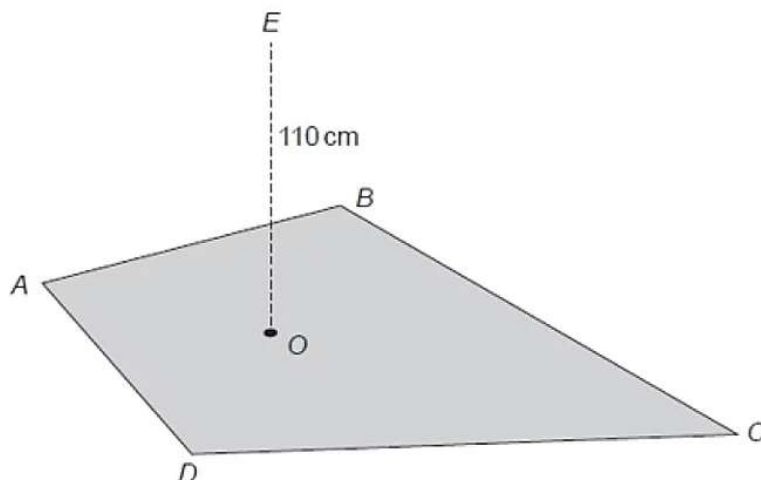


Diagram not drawn to scale

Calculate the length of pole AE .

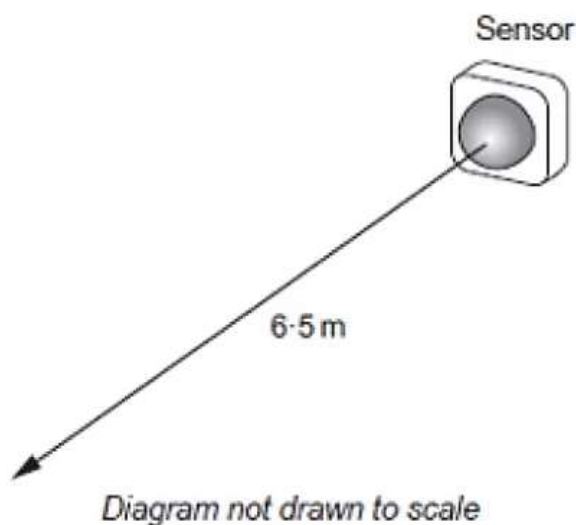
Give your answer as a surd.

You do not need to simplify your answer.

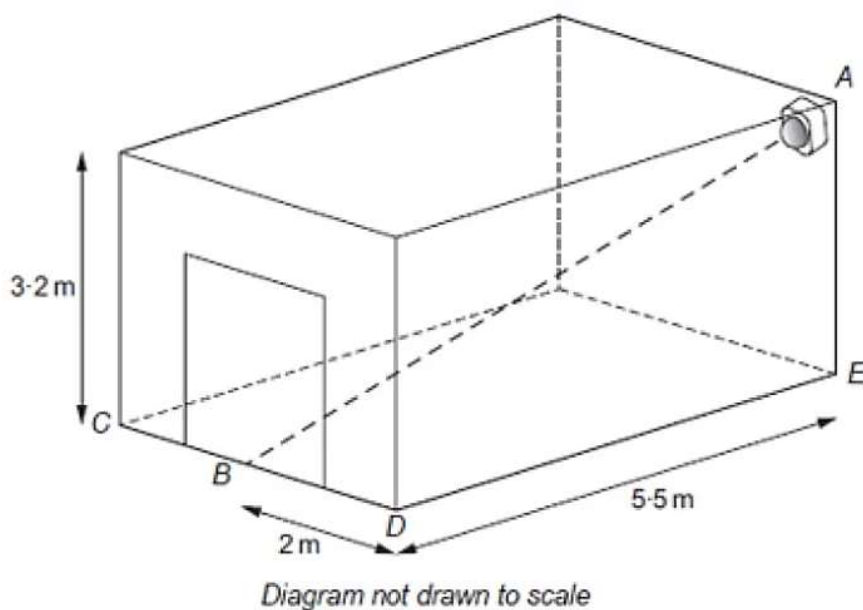
[4]

Higher Numeracy Summer 2018 P2 Q11

A sensor can detect any movement up to a distance of 6.5 m.



- (a) A storeroom is in the shape of a cuboid, as shown below.
 The sensor is placed at A , so that
- it is aimed directly at B , where $BD = 2$ m,
 - the front of the sensor is 20 cm from A along the line AB .



Will the sensor be able to detect movement at B ?
 You must show all your working.

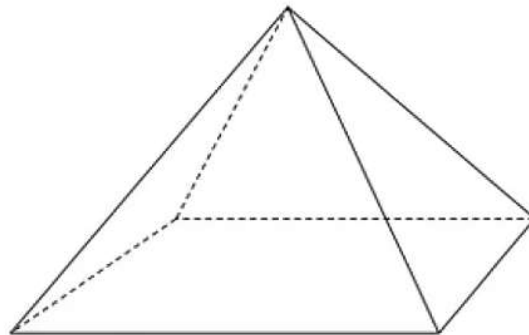
[5]

- (b) Show that $\hat{BAE} = 61.3^\circ$, correct to 1 decimal place.

[3]

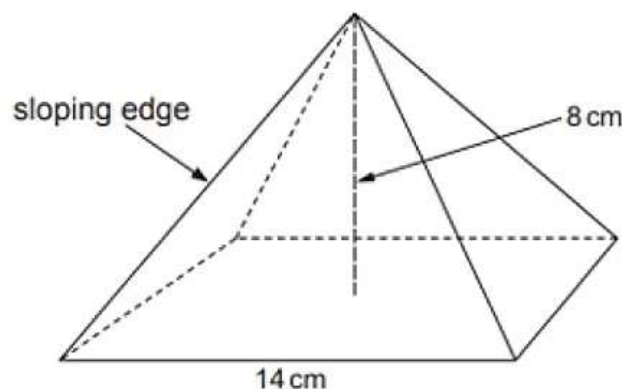
Higher Numeracy Nov 2018 P1 Q12

An architect has been asked to design a square-based glass pyramid that is to be built in a park. The vertex at the top of the pyramid will be directly above the centre of the square base. The edges of the pyramid will be made from steel. Each sloping face will be made from glass.

*Diagram not drawn to scale*

- (a) The architect first plans to make a scale model of the pyramid. The scale model will have base sides of length 14 cm and a vertical height of 8 cm.

The architect has drawn the following diagram of the model.

*Diagram not drawn to scale*

Calculate the length of each sloping edge of the model.

Give your answer in the form $a\sqrt{b}$, where a is an integer and b is a prime number. [6]

- (b) The area of each glass face on the scale model is 74 cm^2 . The full-size pyramid is to have a vertical height of 1.6 metres.

Use these values to calculate the area of each glass face on the full-size pyramid. Give your answer in cm^2 . [5]

Higher Numeracy Sample 2 P1 Q12

12. Anwen is designing an indoor play centre.

The cuboid $ABCDEFGH$ represents a diagram of the room to be used for the play centre.

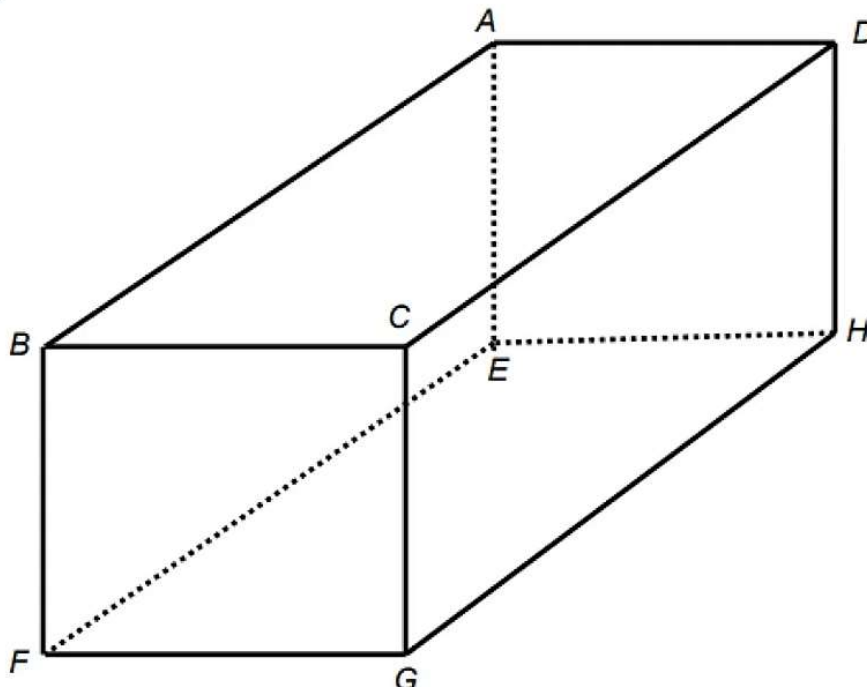


Diagram not drawn to scale

Anwen measures the vertical height of the room to be 5 m.
She measures the distance along the floor from E to F to be 9 m.
The distance from E to G is 12 m.

Anwen is thinking of purchasing a long straight slide for the play centre.
The total length of the slide, including space to get on and off, is 12.5 m.

Would it be possible to fit the slide into the room?
You must show all your working.

[4]

14. The diagram below shows a cuboid with $HG = 3$ cm, $AE = 5$ cm and $EH = 7$ cm.

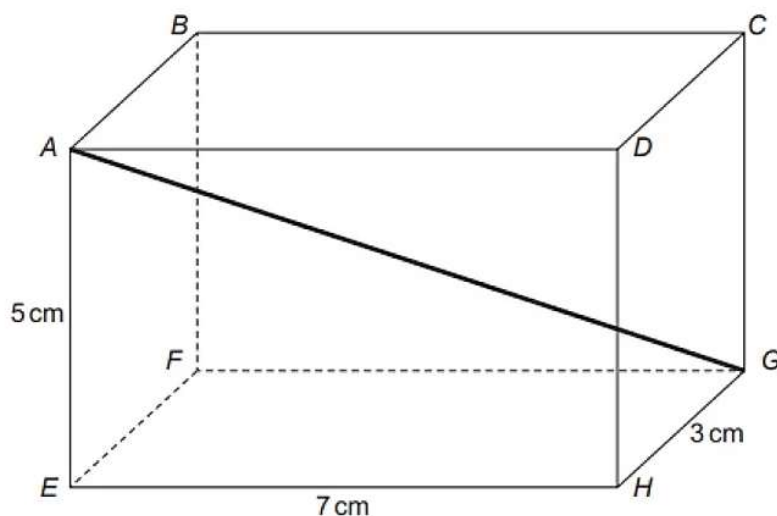


Diagram not drawn to scale

Calculate the length of the line AG.
Give your answer correct to 2 decimal places.

[4]

Higher Maths June 2017 P2 Q21

The cube below has an internal diagonal of length 20 cm.
Each edge of the cube is of length x cm.

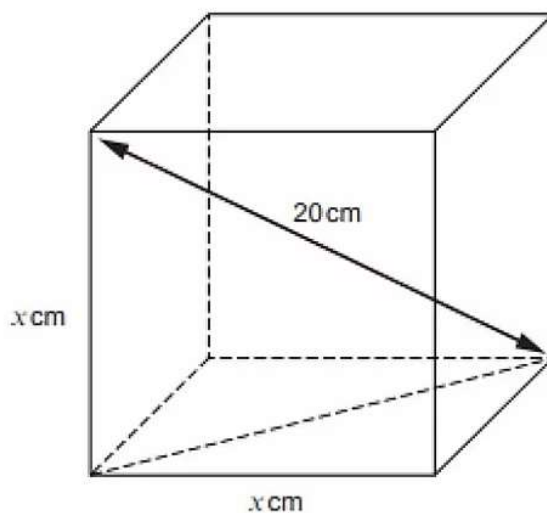


Diagram not drawn to scale

Calculate the value of x .
You must use an algebraic method and show all your working.

[4]

The diagram shows a 5m wide section of road that has a uniform gradient.

The shaded area represents level ground.

Two cyclists, Delyth and loan, approach this section of road.

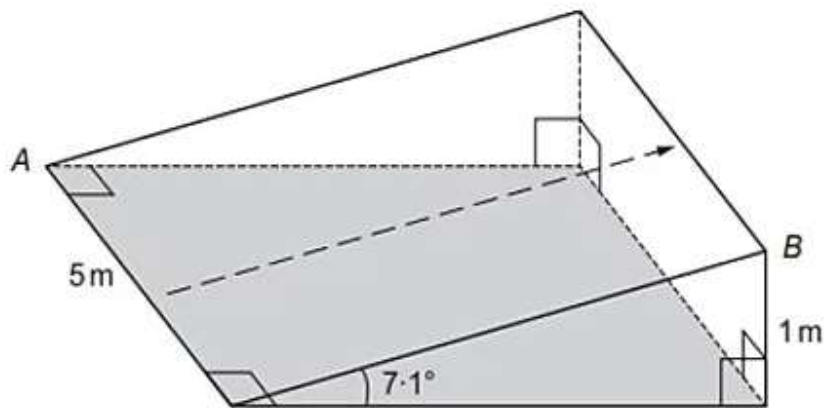


Diagram not drawn to scale

Delyth cycles straight up the middle of the road as shown by the arrow.

loan thinks this section of road is too steep to cycle straight up, so he decides to cycle from A to B in a straight line.

(a) How far does loan cycle in going from A to B? [6]

(b) Show that loan's route up this section of road is less steep than Delyth's route. You must show all your working. [3]