

3D Pythagoras and Trigonometry

Please write clearly in block capitals

Forename:

Surname:

Materials

For this paper you must have:

- mathematical instruments



You **can** use a calculator.

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer all questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work you do not want to be marked.

Information

- The marks for questions are shown in brackets.
- You may ask for graph paper, tracing paper and more answer paper. These must be tagged securely to this answer book.

Advice

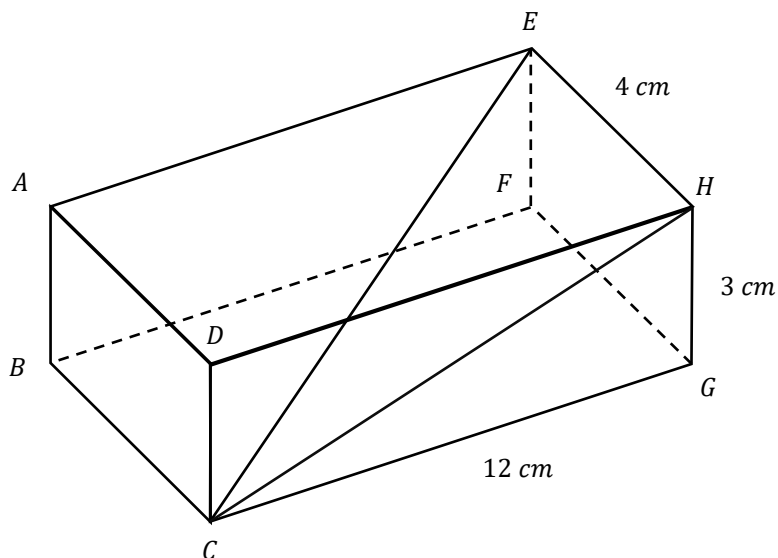
- In all calculations, show clearly how you work out your answer.

- 1 A cuboid is pictured in the diagram below.

$$EH = 4\text{ cm}$$

$$GH = 3\text{ cm}$$

$$CG = 12\text{ cm}$$



Not drawn accurately

- 1(a) Find the length CH

[2 mark2]

Answer _____ cm

- 1(b) Using your previous answer, find the length CE .

Give your answer to 2dp.

[2 mark]

Answer _____ cm

Turn over ►

2 A cuboid is pictured in the diagram below.

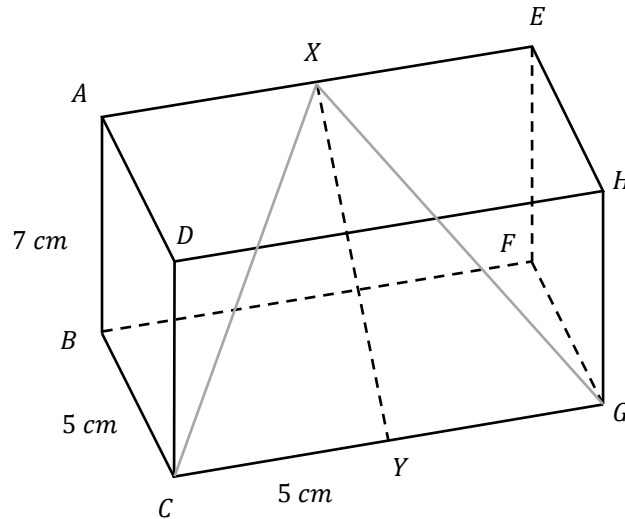
$$AB = 7\text{ m}$$

$$BC = 5\text{ m}$$

$$CY = 5\text{ m}$$

X is the midpoint of AE

Y is the midpoint of CG



Not drawn accurately

2(a) Find the length XY .

Give your answer to 2dp.

[2 mark]

Answer _____ cm

2(b) Using your answer to part a, find the length CX .

Give your answer to 2dp.

[1 mark]

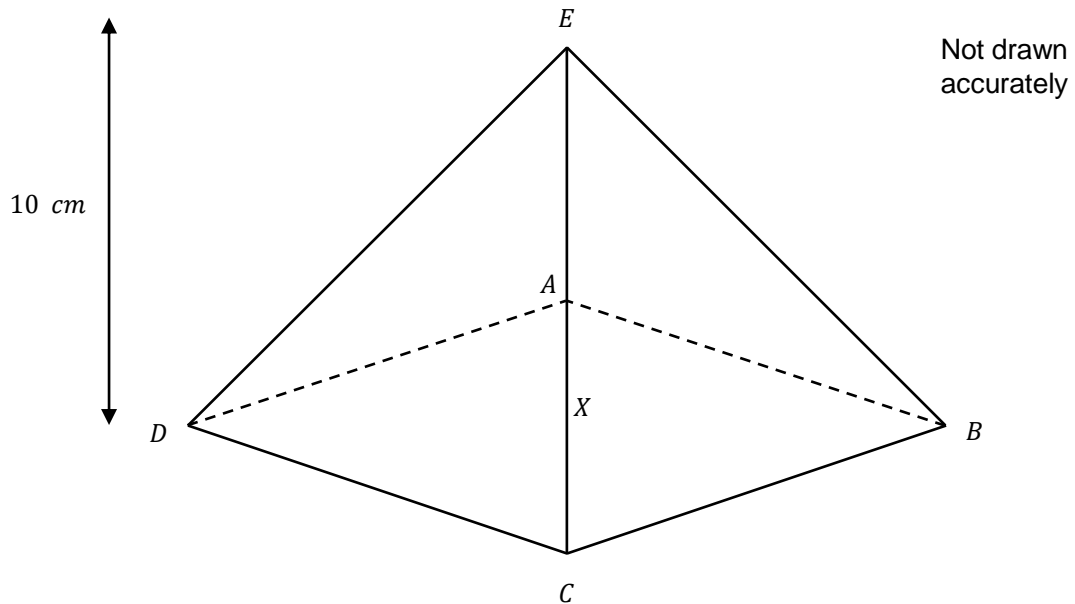
Answer _____ cm

3 A square-based pyramid has the following properties.

Length $DC = 12\text{ cm}$

The vertical height = 10 cm

Point X is the centre of the square.



3(a) Find length AE

Give your answer to 2dp.

[2 mark]

Answer _____ cm

3(b) Find the angle AEB

Give your answer to 2dp.

[2 mark]

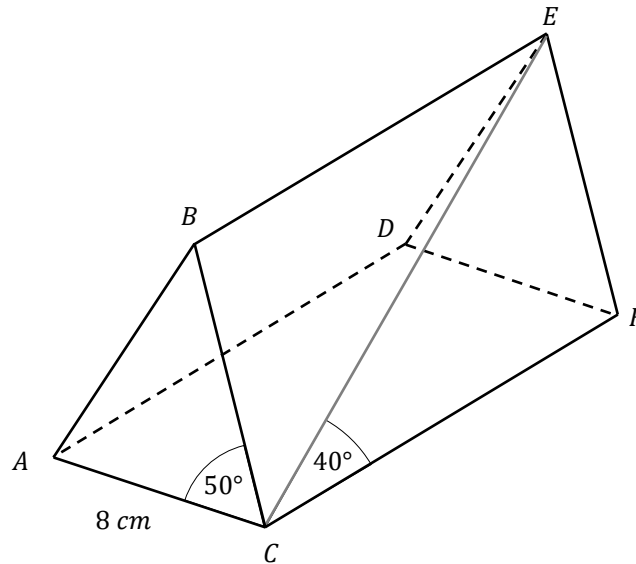
Answer _____ cm

4 The diagram below shows an isosceles triangular prism.

$$AC = 8\text{ cm}$$

$$\text{Angle } BCA = 50^\circ$$

$$\text{Angle } FCE = 40^\circ$$



Not drawn accurately

Find the length EC .

Give your answer to 2dp.

[3 marks]

Answer: _____

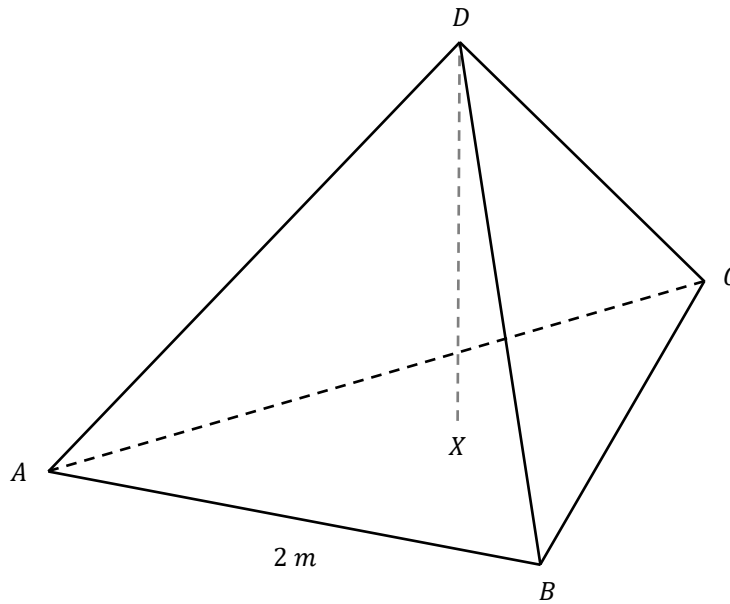


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- 5 The diagram shows a tetrahedron
 All faces are equilateral triangles with side length 2m.
 Point X lies directly below point D .



Not drawn
 accurately

Find the length DX
 Give your answer to 2dp.

[3 marks]

Answer _____

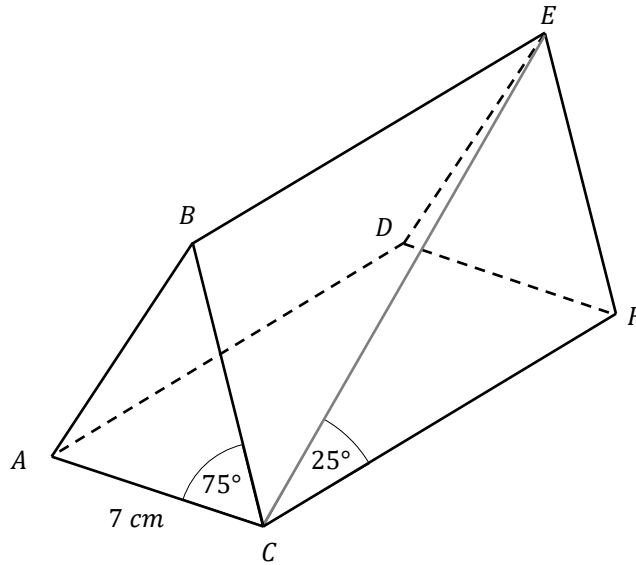
Turn over for next question

6 In the triangular prism below:

$$AC = 7 \text{ cm}$$

$$\text{Angle } BCA = 75^\circ$$

$$\text{Angle } FCE = 25^\circ$$



Not drawn
accurately

Calculate the volume of the prism.

Give your answer to 2dp.

[4 marks]

Answer _____

Turn over for next question

7 The diagram below shows a doorstop, modelled as a triangular prism.

$$\text{Angle } ABC = 90^\circ$$

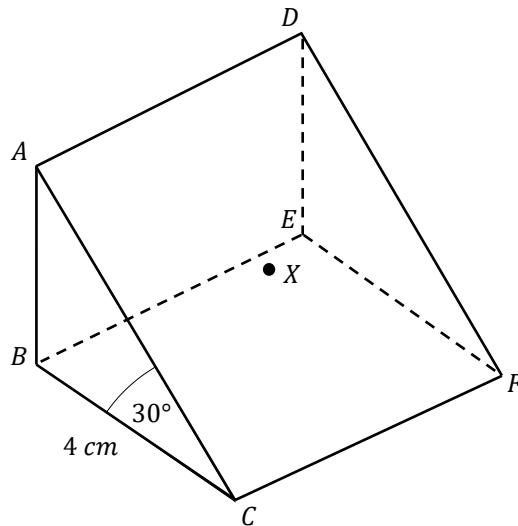
$$\text{Angle } ACB = 30^\circ$$

$$BC = 4 \text{ cm}$$

$$AD = 2AB$$

X is a point on the **centre** of the face $ADFC$.

$$AX = \frac{a\sqrt{6}}{3}$$



Not drawn accurately

Find the value of a .

[4 marks]

Answer _____

End of Questions

Turn over ►