

3D Pythagoras and Trigonometry

For AQA GCSE Mathematics (8300) • Higher tier

Name _____

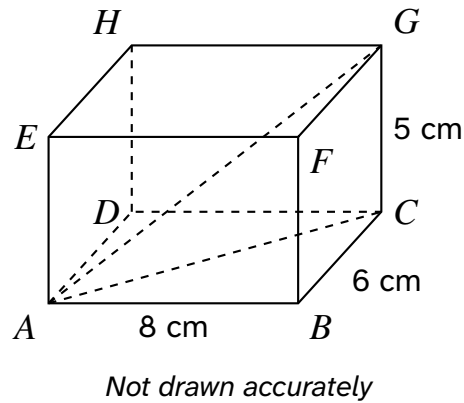
Total marks: **25**

Answer **all** questions in the spaces provided. Show your working: marks are given for correct method. You may use a calculator. Diagrams are not drawn accurately.

- 1** A cuboid measures 3 cm by 4 cm by 12 cm.
Work out the length of the longest straight line that can be drawn inside the cuboid.
[2 marks]

Answer _____ cm

- 2 The diagram shows a cuboid $ABCDEFGH$.



- (a) Work out the length AG .

[3 marks]

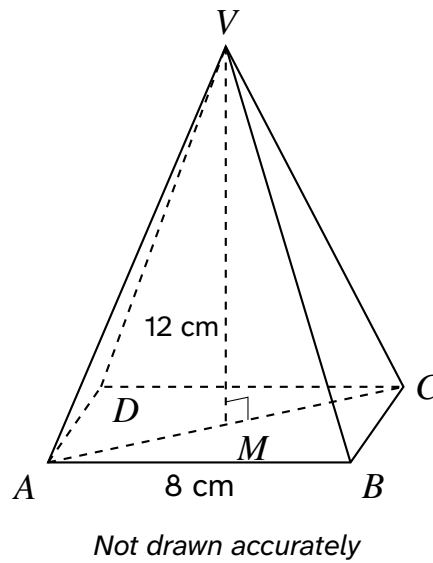
Answer _____ cm

- (b) Work out the angle between AG and the base $ABCD$.

[3 marks]

Answer _____ degrees

- 3 $VABCD$ is a pyramid with a square base of side 8 cm.
 M is the centre of the base and V is vertically above M . $VM = 12$ cm.



- (a) Work out the length VA .

[3 marks]

Answer _____ cm

- (b) Work out the angle between VA and the base.

[2 marks]

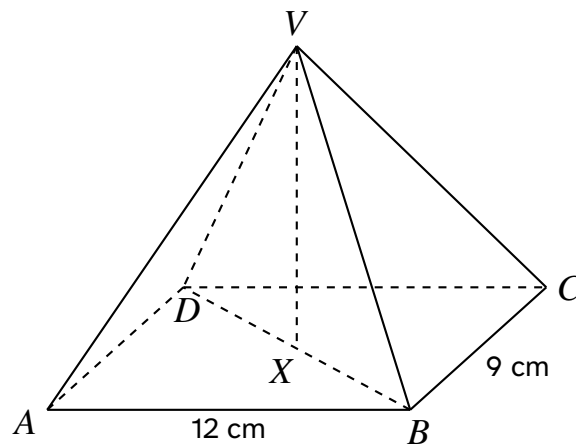
Answer _____ degrees

- 4 A cube has edges of length 5 cm.
A straight line is drawn inside the cube from one corner to the opposite corner.
Work out the angle between this line and the base of the cube.

[3 marks]

Answer _____ degrees

- 5 Here is a pyramid.



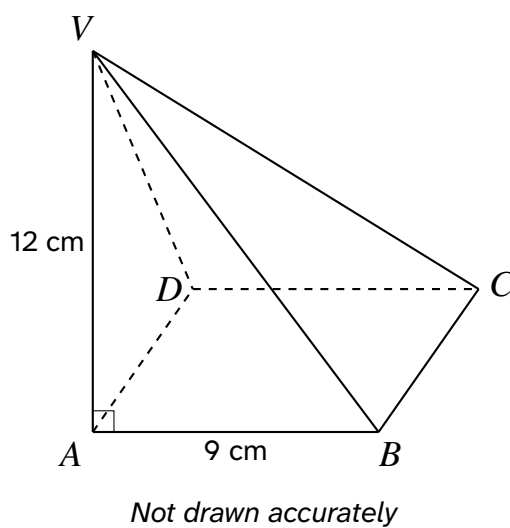
Not drawn accurately

The base $ABCD$ of the pyramid is a horizontal rectangle.
The diagonals of the base cross at X , and the vertex V is directly above X .
 $AB = 12\text{ cm}$ and $BC = 9\text{ cm}$
The angle between VB and the base is 40°
Work out the height VX of the pyramid.

[3 marks]

Answer _____ cm

- 6 The base $ABCD$ of pyramid $VABCD$ is a horizontal square of side 9 cm. The vertex V is directly above the corner A . $VA = 12$ cm



- (a) Show that $VB = 15$ cm

[2 marks]

- (b) Work out the angle between VC and the base $ABCD$.

[4 marks]

Answer _____ degrees