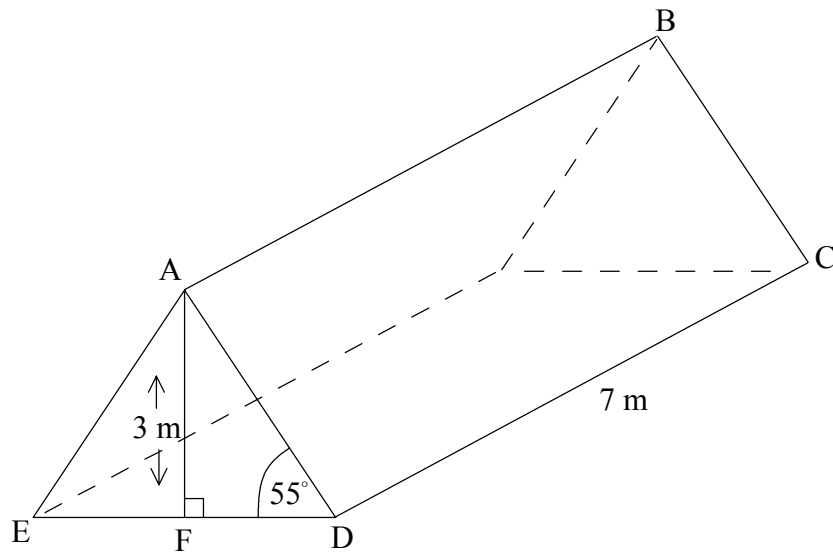
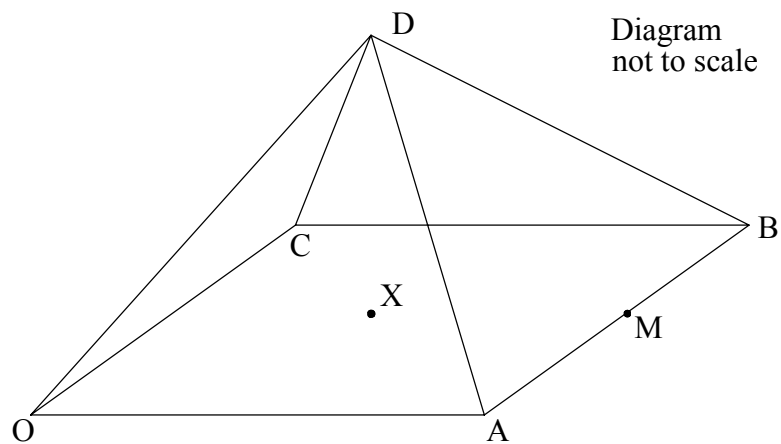


3D Trig

- 1) The following diagram shows a sloping roof. The surface ABCD is a rectangle. The angle ADE is 55° . The vertical height, AF, of the roof is 3 m and the length DC is 7 m.

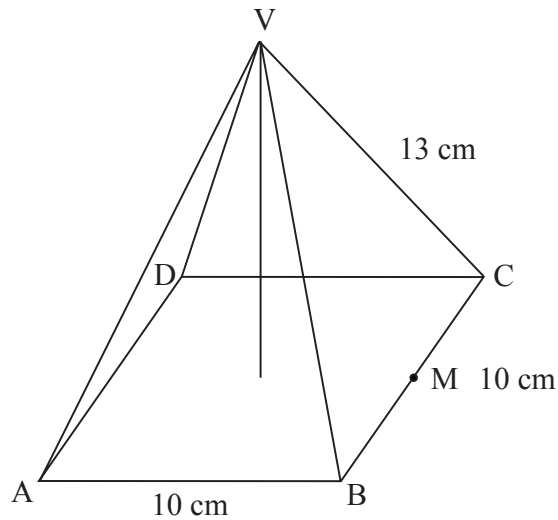


- (a) Calculate AD.
- (b) Calculate the length of the diagonal DB.
- 2) OABCD is a square based pyramid of side 4 cm as shown in the diagram. The vertex D is 3 cm directly above X, the centre of square OABC. M is the mid-point of AB.
- (a) Find the length of XM.
- (b) Calculate the length of DM.
- (c) Calculate the angle between the face ABD and the base OABC.



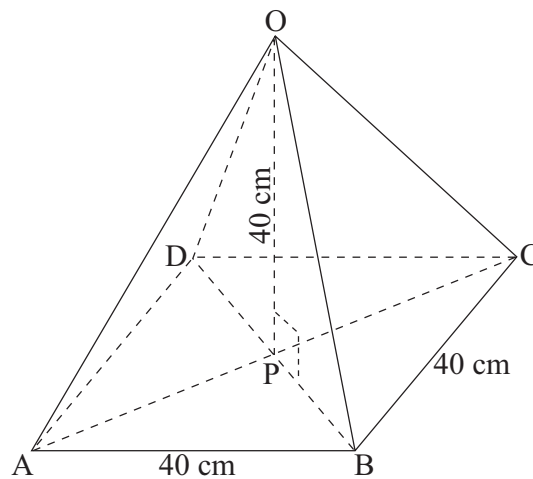
3D Trig

- 3) The diagram shows a pyramid $VABCD$ which has a square base of length 10 cm and edges of length 13 cm. M is the midpoint of the side BC .



- (a) Calculate the length of VM . [2 marks]
- (b) Calculate the vertical height of the pyramid. [2 marks]
- (c) Calculate the angle between a sloping face of the pyramid and its base. [2 marks]

- 4) The right pyramid shown in the diagram has a square base with sides of length 40 cm. The height of the pyramid is also 40 cm.



- (a) Find the length of OB . [4 marks]
- (b) Find the size of angle OBP . [2 marks]

3D Trig

- 5) A rectangular cuboid has the following dimensions.

Length 0.80 metres (AD)
 Width 0.50 metres (DG)
 Height 1.80 metres (DC)

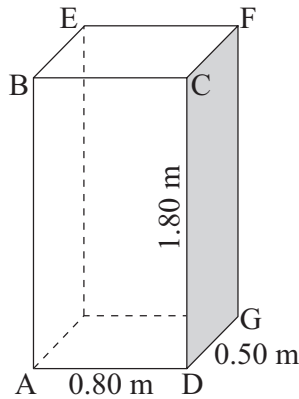
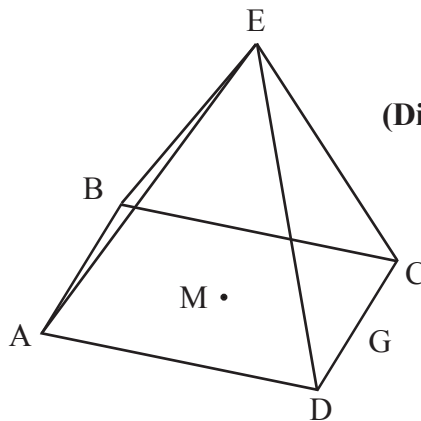


diagram not to scale

- (a) Calculate the length of AG. [2 marks]
- (b) Calculate the length of AF. [2 marks]
- (c) Find the size of the angle between AF and AG. [2 marks]

- 6) The triangular faces of a square based pyramid, ABCDE, are all inclined at 70° to the base. The edges of the base ABCD are all 10 cm and M is the centre. G is the mid-point of CD.



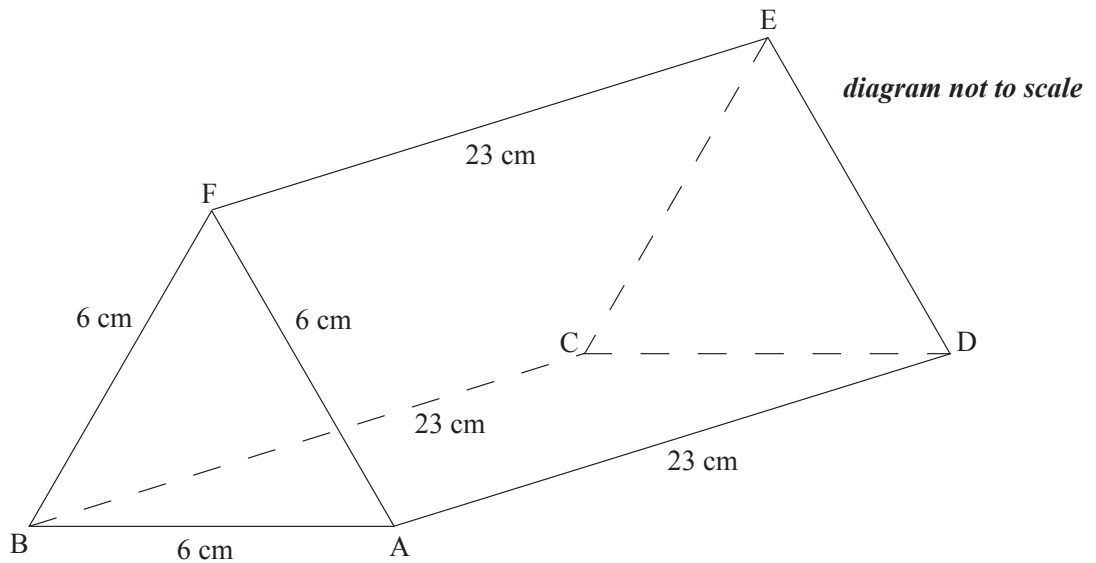
(Diagram not to scale)

- (a) Using the letters on the diagram draw a triangle showing the position of a 70° angle. [1 mark]
- (b) Show that the height of the pyramid is 13.7 cm, to 3 significant figures. [2 marks]
- (c) Calculate
- (i) the length of EG;
- (ii) the size of angle DEC. [4 marks]
- (d) Find the total surface area of the pyramid. [2 marks]
- (e) Find the volume of the pyramid. [2 marks]

3D Trig

7)

A chocolate bar has the shape of a triangular right prism ABCDEF as shown in the diagram. The ends are equilateral triangles of side 6 cm and the length of the chocolate bar is 23 cm.



- (a) (i) Write down the size of angle BAF.
- (ii) Hence or otherwise find the area of the triangular end of the chocolate bar. *[4 marks]*
- (b) Find the total surface area of the chocolate bar. *[3 marks]*
- (c) It is known that 1 cm^3 of this chocolate weighs 1.5 g. Calculate the weight of the chocolate bar. *[3 marks]*

A different chocolate bar made with the same mixture also has the shape of a triangular prism. The ends are triangles with sides of length 4 cm, 6 cm and 7 cm.

- (d) Show that the size of the angle between the sides of 6 cm and 4 cm is 86.4° correct to 3 significant figures. *[3 marks]*
- (e) The weight of this chocolate bar is 500 g. Find its length. *[4 marks]*