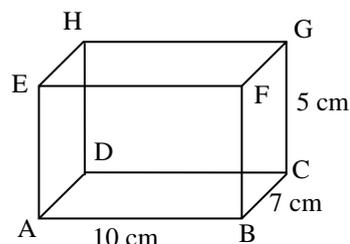


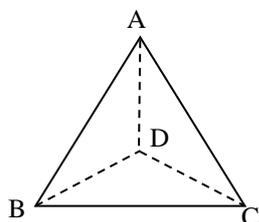
## Section 2: Lines and planes in 3D

### Exercise

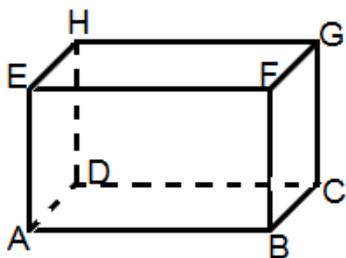
1. The diagram below shows a cuboid ABCDEFGH, with dimensions 10 cm, 7 cm and 5 cm as shown.



- Find the lengths of AC and AG.
  - Find the angle between AG and the plane ABCD.
  - Find the angle between BH and the plane ADHE.
  - Find the angle between the plane BCHE and the plane ABCD.
  - Find the angle between the plane BDG and the plane ABCD.
2. A regular tetrahedron ABCD has edges of length 6 cm.



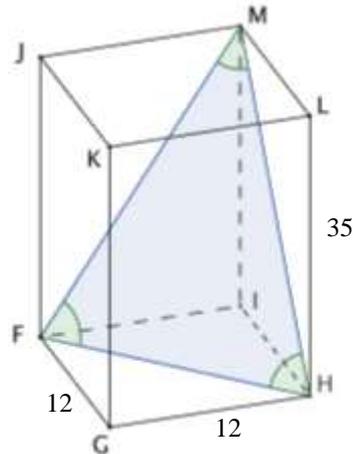
- Find the height of the vertex A above the base BCD.
  - Find the angle between the line AB and the plane BCD.
  - Find the angle between the plane ABC and the plane BCD.
3. The diagram shows a cuboid.  
 $AB = 8$  cm.  $BC = 4$  cm.  $AG = 12$  cm.



Not accurately drawn

Calculate the volume of the cuboid.

4. A cuboid as shown in the diagram, has a square base with side lengths 12 and height 35.
- Find the angle  $HFM$
  - Find the angle of greatest slope between the triangle  $FMH$  and the base of the cuboid,  $FGHI$ .



5. A triangular based pyramid has a base  $ABC$ , which is an equilateral triangle with side length 2. The apex,  $D$ , is directly above the centre of  $\triangle ABC$ , and
- $$\angle ADB = \angle BDC = \angle CDA = 30^\circ.$$
- Find the length  $AD$
  - Find the distance from the base of the pyramid to  $D$
  - Find the Angle between  $\triangle ABD$  and  $\triangle ABC$
6. Jack can see a tower in the distance. He chooses 2 points,  $A$  and  $B$  that are 20m apart and both at ground level. The angle of elevation of the top of the tower from  $A$  is  $10^\circ$ . He also measures angle  $OAB$  as  $70^\circ$  and angle  $OBA$  as  $100^\circ$ .
- Find the distance of the tower from  $A$ .
  - Find the height of the tower