**19** The diagram shows a triangular prism.

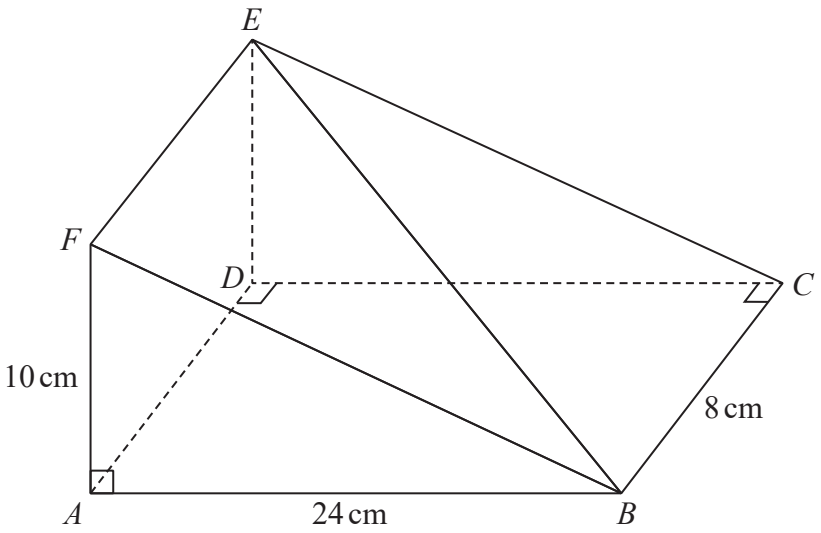


Diagram **NOT** accurately drawn

$AF = 10$ cm, $AB = 24$ cm and $BC = 8$ cm.
Angle $FAB$ = angle $ADC$ = angle $BCD = 90°$

Work out the size of the angle between the line $BE$ and the plane $ABCD$.
Give your answer correct to 1 decimal place.

.....°

**(Total for Question 19 is 3 marks)**

**20** Here is a cube *ABCDEFGH*.

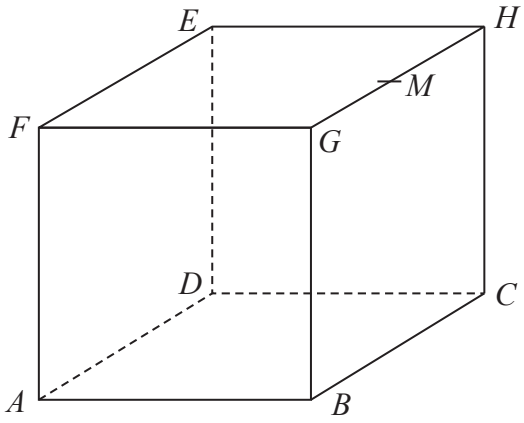


Diagram **NOT** accurately drawn

*M* is the midpoint of the edge *GH*.

Find the size of the angle between the line *MA* and the plane *ABCD*.
Give your answer correct to 1 decimal place.

°

**(Total for Question 20 is 4 marks)**

**21** The diagram shows cuboid *ABCDEFGH*.

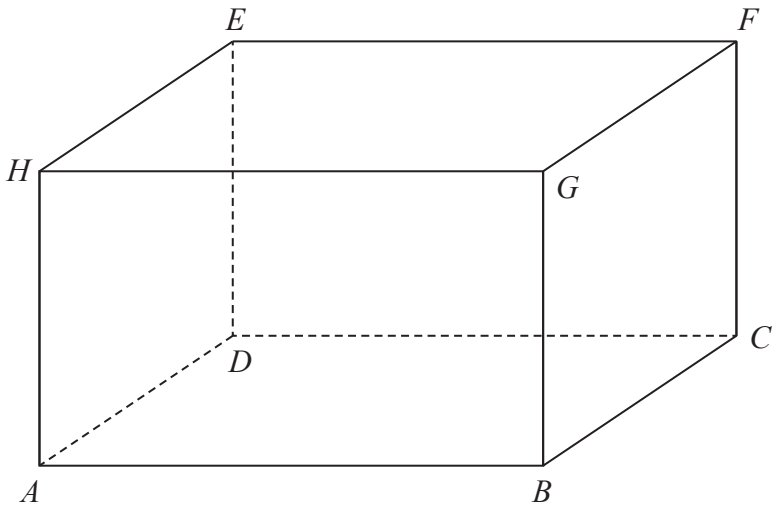


Diagram **NOT** accurately drawn

For this cuboid

the length of *AB* : the length of *BC* : the length of *CF* = 4 : 2 : 3

Calculate the size of the angle between *AF* and the plane *ABCD*.
Give your answer correct to one decimal place.

.....°

**(Total for Question 21 is 3 marks)**

**23** The diagram shows a solid pyramid *ABCDE* with a horizontal base.

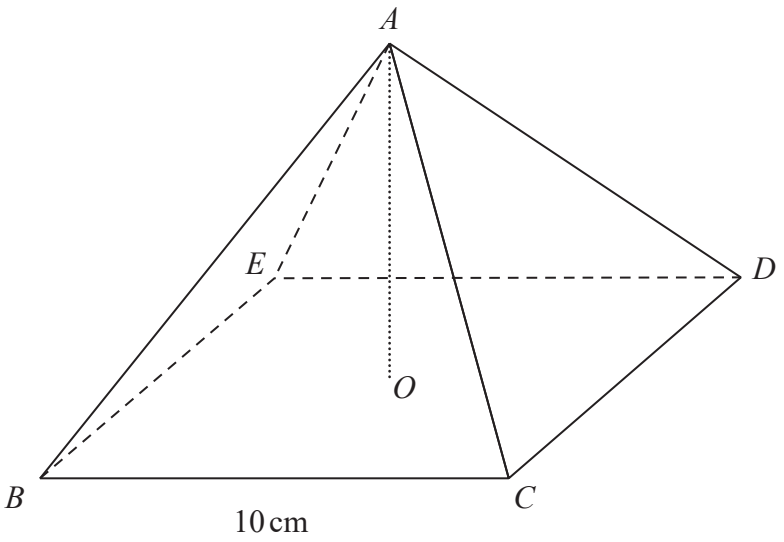


Diagram **NOT** accurately drawn

The base, *BCDE*, of the pyramid is a square of side 10 cm.

The vertex *A* of the pyramid is vertically above the centre *O* of the base so that $AB = AC = AD = AE$

The **total** surface area of the pyramid is 360 $cm^2$

Work out the size of the angle between *AC* and the base *BCDE*.
Give your answer correct to 3 significant figures.

**19** The diagram shows a cuboid *ABCDEFGH*.

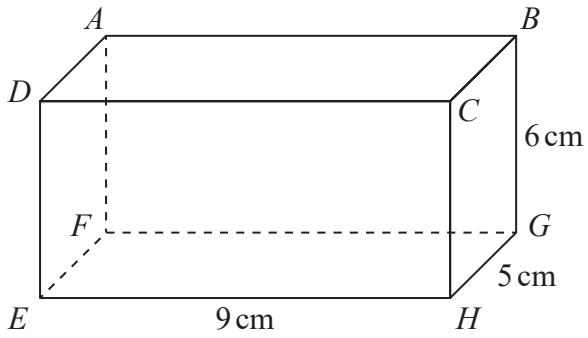


Diagram **NOT** accurately drawn

*EH* = 9 cm, *HG* = 5 cm and *GB* = 6 cm.

Work out the size of the angle between *AH* and the plane *EFGH*.
Give your answer correct to 3 significant figures.

.....°

**(Total for Question 19 is 4 marks)**

**21** The diagram shows the prism *ABCDEF* with cross section triangle *ABC*.

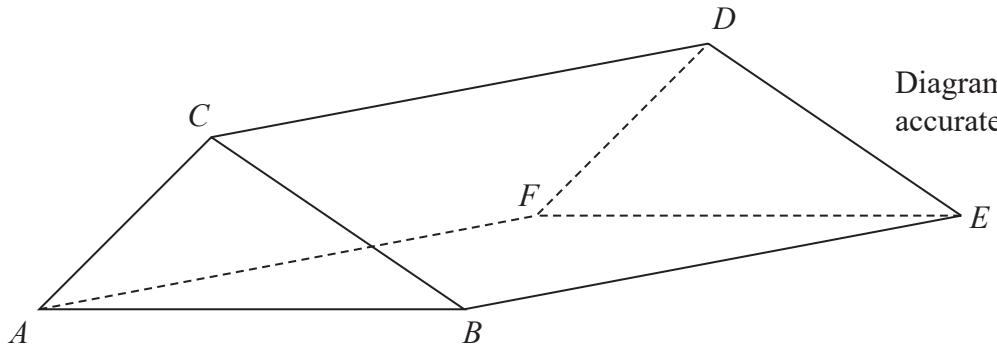


Diagram **NOT** accurately drawn

Angle *BEC* = 40° and angle *ACB* is obtuse.
*AC* = 6 cm and *CE* = 13 cm

The area of triangle *ABC* is 22 $cm^2$

Calculate the length of *AB*.
Give your answer correct to one decimal place.

..... cm

**(Total for Question 21 is 6 marks)**

**17** The diagram shows a prism *ABCDEFGH* with a horizontal base.

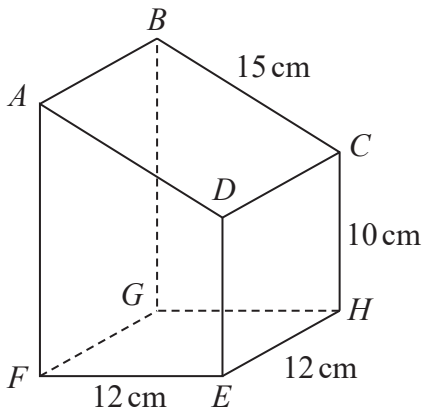


Diagram **NOT** accurately drawn

The base of the prism, *EFGH*, is a square of side 12 cm.
Trapezium *ADEF* is a cross section of the prism where *AF* and *DE* are vertical edges.

*DE* = *CH* = 10 cm
*AD* = *BC* = 15 cm

(a) Work out the size of the angle between *CF* and the base *EFGH*.
Give your answer correct to one decimal place.

..... °

**(3)**

(b) Work out the length of *BE*.
Give your answer correct to one decimal place.

..... cm

**(3)**

**(Total for Question 17 is 6 marks)**

**18** The diagram shows cuboid *ABCDEFGH*.

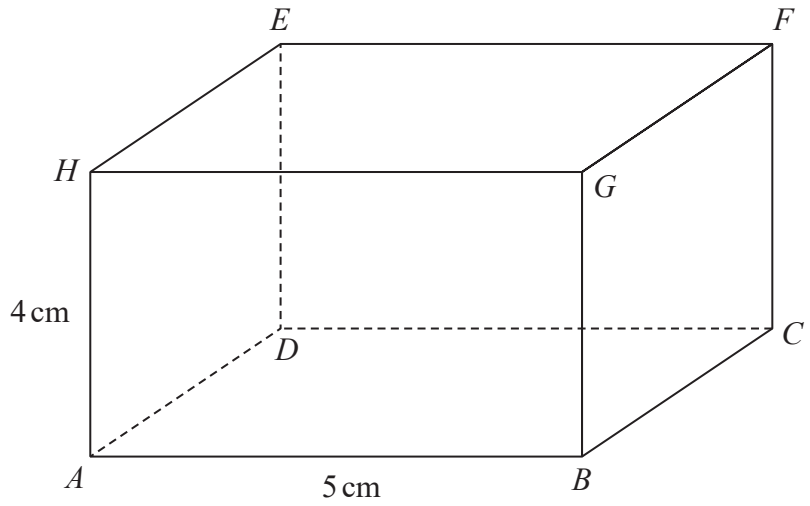


Diagram **NOT** accurately drawn

$AB = 5$ cm
$AH = 4$ cm
The size of the angle between $CH$ and the plane $ABCD$ is 35°

Calculate the volume of the cuboid.
Give your answer correct to 3 significant figures.

.....cm$^3$

**(Total for Question 18 is 5 marks)**

**17** The diagram shows a solid prism *ABCDEFGH*.

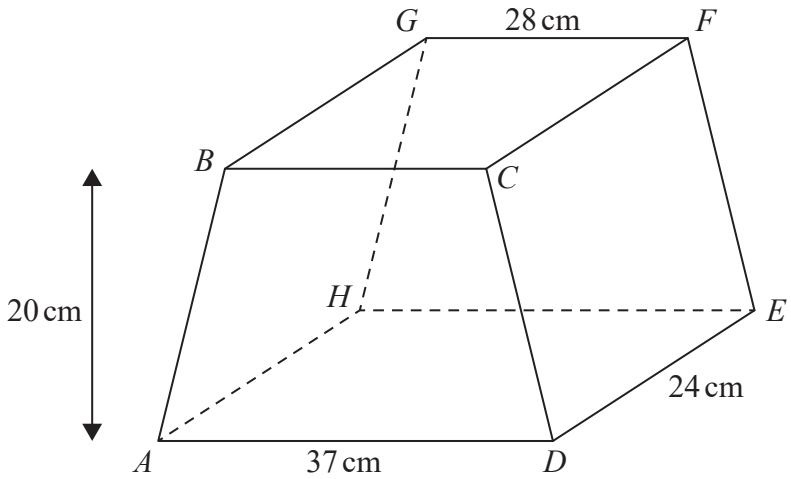


Diagram **NOT** accurately drawn

The trapezium *ABCD*, in which *AD* is parallel to *BC*, is a cross section of the prism.
The base *ADEH* of the prism is a horizontal plane.
*ADEH* and *BCFG* are rectangles.
The midpoint of *BC* is vertically above the midpoint of *AD* so that *BA* = *CD*.

*AD* = 37 cm  *GF* = 28 cm  *DE* = 24 cm

The perpendicular distance between edges *AD* and *BC* is 20 cm.

(a) Work out the total surface area of the prism.

..... cm²

**(4)**

(b) Calculate the size of the angle between $AF$ and the plane $ADEH$.
Give your answer correct to one decimal place.

.....°

**(3)**

**(Total for Question 17 is 7 marks)**

**22** $ABC$ is an isosceles triangle in a horizontal plane.
The point $T$ is vertically above $B$.

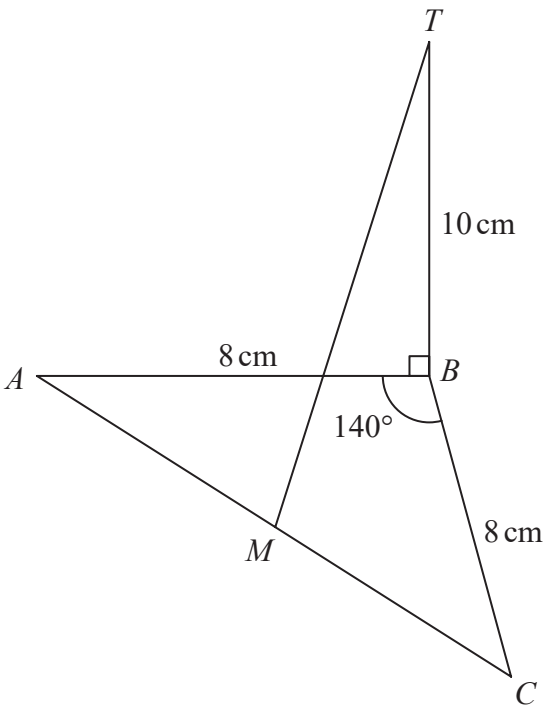


Diagram **NOT** accurately drawn

Angle $ABC = 140°$
$AB = BC = 8$ cm
$TB = 10$ cm
$M$ is the midpoint of $AC$.

Calculate the size of the angle between $MT$ and the horizontal plane $ABC$.
Give your answer correct to one decimal place.