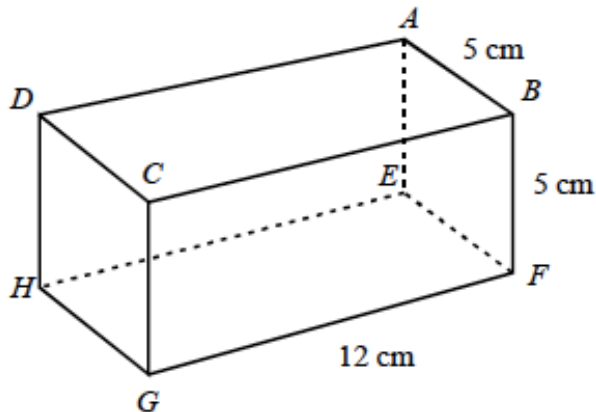


Topic 20 Further trigonometry (Pre-TT) [36]

1.

$ABCDEFGH$ is a cuboid with sides of 5 cm, 5 cm and 12 cm as shown.



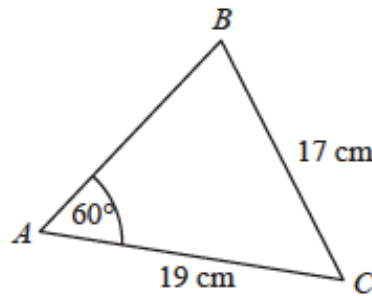
Not to scale

Calculate angle DFH .

(Total 5 marks)

2.

- (a) ABC is a triangle.
 $AC = 19$ cm, $BC = 17$ cm and angle $BAC = 60^\circ$

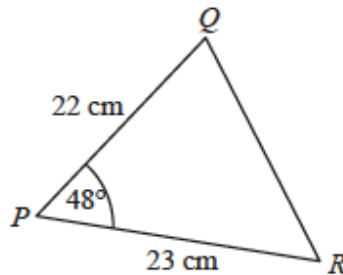


Not to scale

Calculate the size of angle ABC .

(3)

- (b) PQR is a triangle.
 $PR = 23$ cm, $PQ = 22$ cm and angle $QPR = 48^\circ$



Not to scale

Calculate the length of QR .
 Give your answer to an appropriate degree of accuracy.

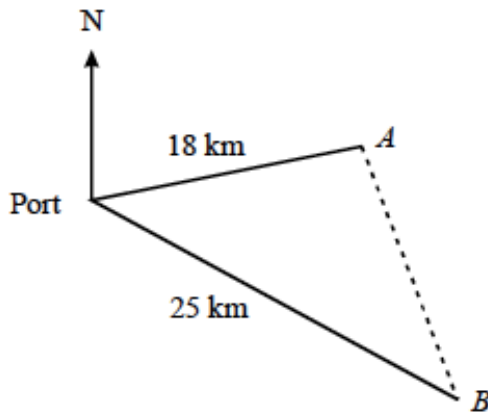
(4)
 (Total 7 marks)

3.

Two ships, A and B , leave port at 13 00 hours.

Ship A travels at a constant speed of 18 km per hour on a bearing of 070° .

Ship B travels at a constant speed of 25 km per hour on a bearing of 152° .



Not drawn accurately

Calculate the distance between A and B at 14 00 hours.

(Total 4 marks)

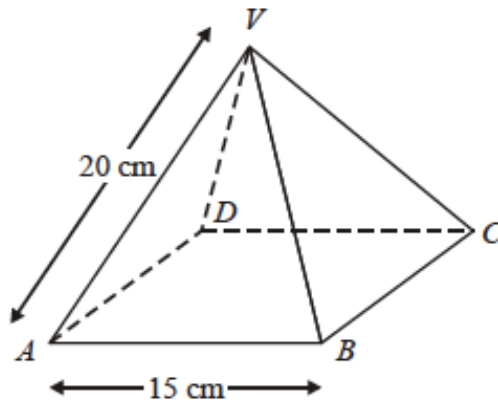
4.

$VABCD$ is a right pyramid on a square base.

V is vertically above the centre of the square.

$VA = VB = VC = VD = 20$ cm

$AB = 15$ cm



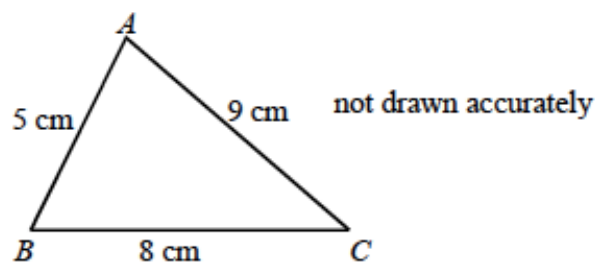
Not drawn accurately

Calculate the angle between the edge VA and the base $ABCD$.

(Total 5 marks)

5.

In triangle ABC , $AB = 5$ cm, $BC = 8$ cm and $AC = 9$ cm.



not drawn accurately

Use the cosine rule to show that triangle ABC does **not** contain an obtuse angle.

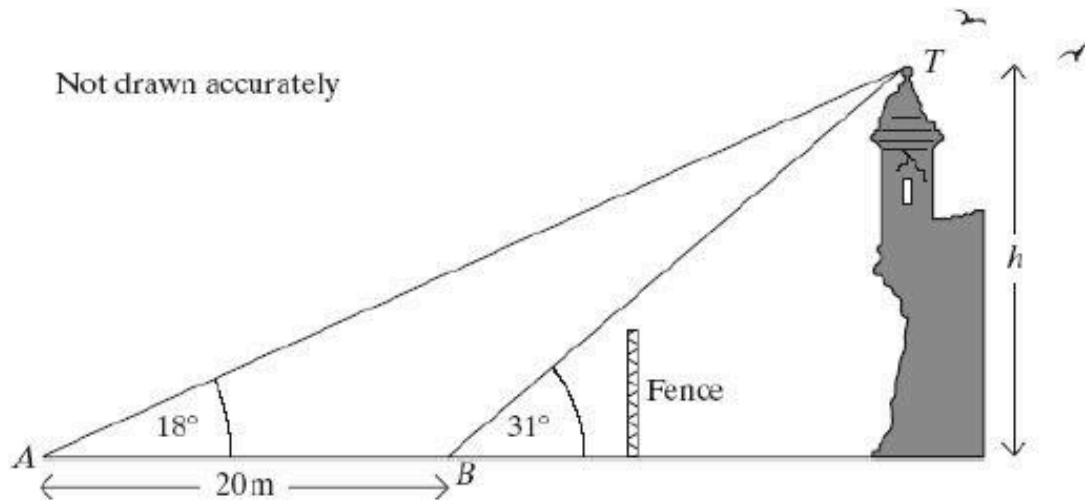
(Total 3 marks)

6.

A ruined tower is fenced off for safety reasons.

To find the height of the tower Rashid stands at a point A and measures the angle of elevation as 18° .

He then walks 20 metres directly towards the base of the tower to point B where the angle of elevation is 31° .



Calculate the height, h , of the tower.

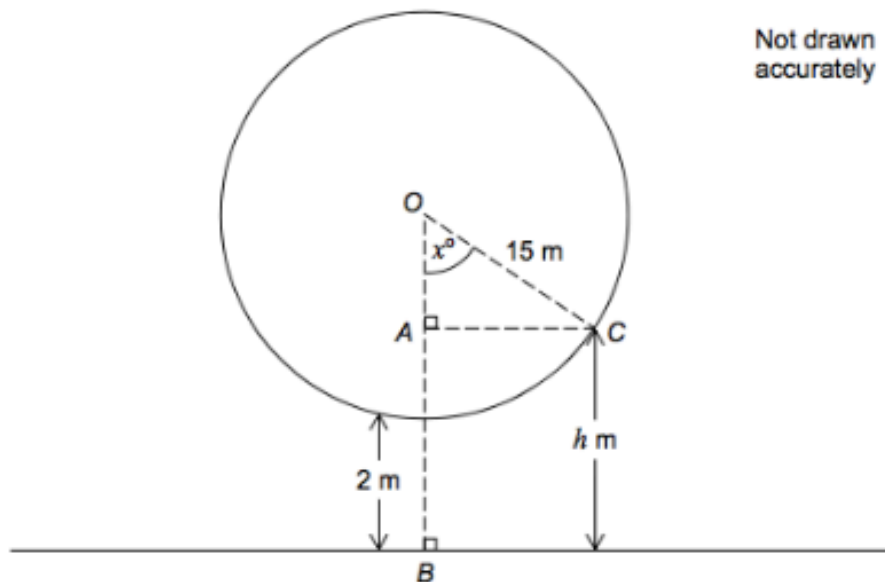
(Total 6 marks)

7.

A Big Wheel is modelled as a circle with centre O and radius 15 metres.

The wheel turns in an anticlockwise direction.

The lowest point on the wheel is always 2 metres above horizontal ground.



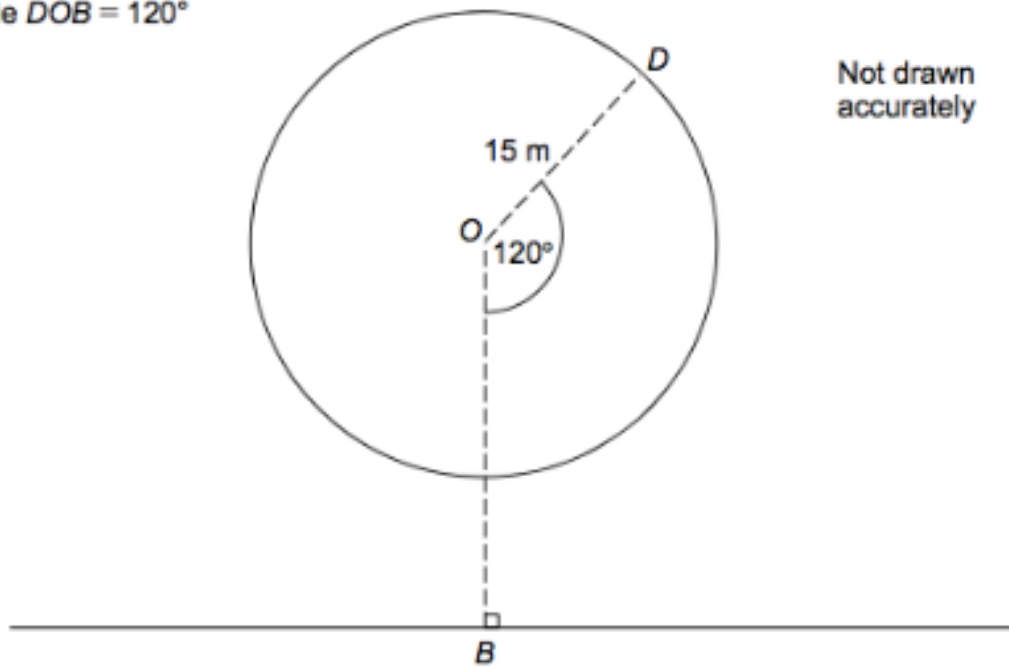
(a) C is a point on the wheel, h metres above horizontal ground.

Angle $COB = x^\circ$

Show that $h = 17 - 15 \cos x^\circ$

[2 marks]

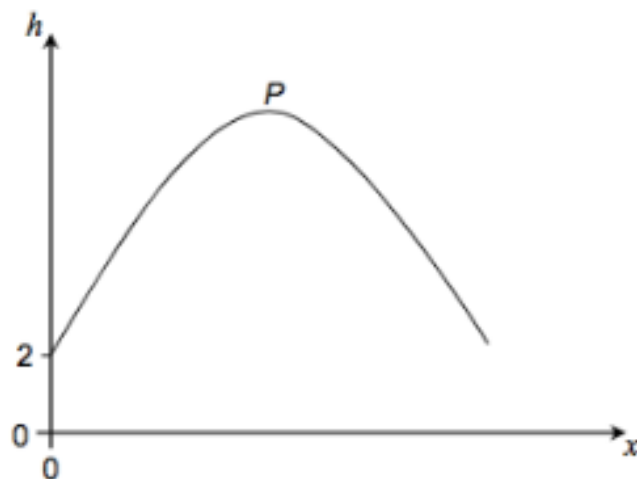
- (b) D is a point on the wheel.
 Angle $DOB = 120^\circ$



Work out the height of D above horizontal ground.

[2 marks]

- (c) Here is a sketch of the graph $h = 17 - 15 \cos x^\circ$ for one **complete** turn of the wheel.
 P is the highest point on the graph.



Work out the coordinates of P .

[2 marks]