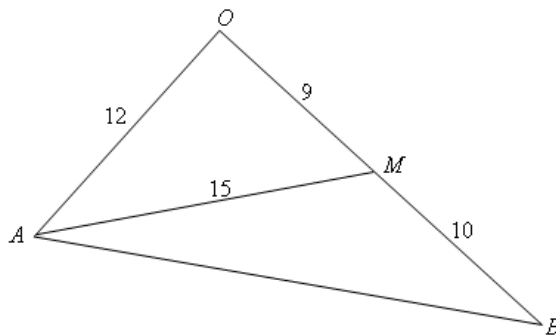


**Applications of Trigonometry
Worksheet II**

Question 1

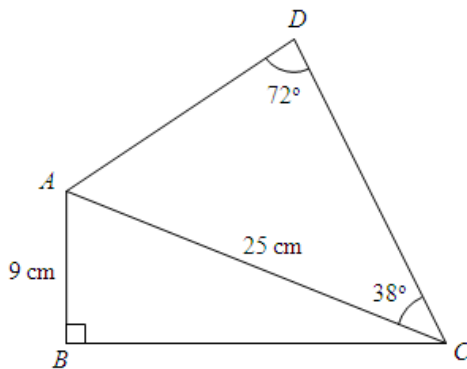


In $\triangle AMB$, $AM = 15$ cm and $BM = 10$ cm.
 O is a point on BM produced, where $OM = 9$ cm and $OA = 12$ cm.

- (a) Explain why $\angle AOM$ is a right angle.
- (b) Expressing your answers as fractions in their lowest terms where applicable, find
 - (i) $\tan \angle ABO$,
 - (ii) $\cos \angle AMB$.

Ans: (a) Explain using converse of Pythagoras' Thm (b) (i) $\frac{12}{19}$ (ii) $-\frac{3}{5}$

Question 2

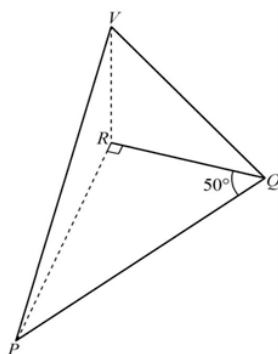


In the figure $ABCD$ is a quadrilateral such that $\angle ABC = 90^\circ$, $AC = 25$ cm, $\angle ADC = 72^\circ$, $AB = 9$ cm and $\angle ACD = 38^\circ$. Calculate

- (a) the length of AD .
- (b) the length of BC ,
- (c) $\angle BCD$.

Ans: (a) 16.2 cm (3 sf) (b) 23.3 cm (3 sf) (c) 59.1° (1 dp)

Question 3

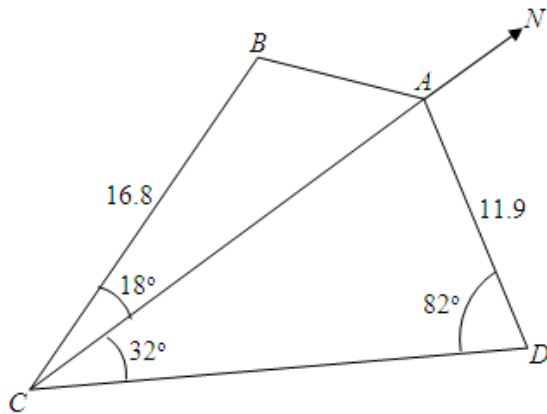


In the diagram, the base of the pyramid $VPQR$ is a right-angled triangle PQR and it lies on a horizontal plane. Given that $QR = 8$ cm, $VR = 7$ cm, $\angle PQR = 50^\circ$ and the edge VR is vertical.

- Calculate
- (a) PQ ,
 - (b) QV ,
 - (c) $\angle VQR$.

Ans: (a) 12.4 cm (3 sf) (b) 10.6 cm (3 sf) (c) 41.2° (1 dp)

Question 4

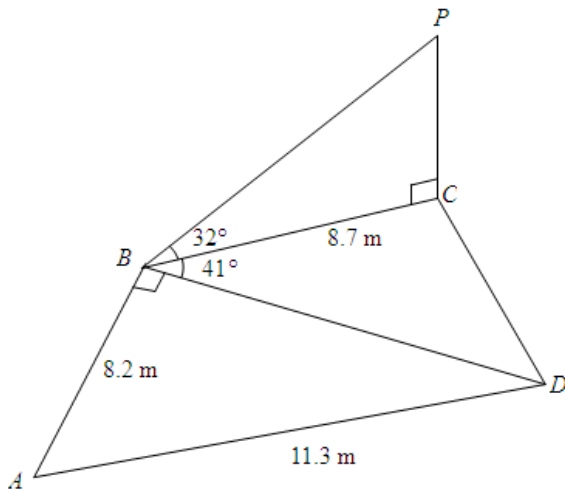


The diagram shows a horizontal field $ABCD$ where C is due south of A . $BC = 16.8$ m, $AD = 11.9$ m, $\angle ACD = 32^\circ$, $\angle ADC = 82^\circ$ and $\angle ACB = 18^\circ$.

- (a) Show that AC is approximately 22.24 m.
- (b) Calculate
 - (i) the bearing of C from D .
 - (ii) AB .
 - (iii) how far D is south of A .
- (c) A vertical mast is erected at D , such that the greatest angle of elevation of the top of the mast from A is 35° . Calculate the height of the mast.

Ans: (b) (i) 212° (ii) 8.13 m (3sf) (iii) 4.84 m (3 sf) (c) 8.33 m (3 sf)

Question 5

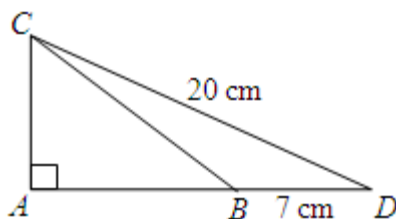


In the diagram, A, B, C and D are four corners of a horizontal field. PC represents a vertical flagpole. A path runs from point B to point D . $\angle ABD = 90^\circ$, $\angle CBD = 41^\circ$, $BC = 8.7$ m, $AB = 8.2$ m, $AD = 11.3$ m and the angle of elevation of the top of the flagpole from B is 32° .

- Calculate
- (a) the length of the path BD and hence show that $CD = 5.83$ m,
 - (b) the height of the flagpole,
 - (c) the size of $\angle BAD$,
 - (d) the shortest distance from C to the path BD ,
 - (e) the greatest angle of depression from the top of the flagpole to a point on the path BD .

Ans: (a) 5.83 m (3 sf) (b) 5.44 m (3 sf) (c) 43.5° (1 dp) (d) 5.71 m (3 sf) (e) 43.6° (1 dp)

Question 6



In the diagram above, ABD is a straight line. $\angle CAB = 90^\circ$, $CD = 20$ cm, $BD = 7$ cm and the area of $\triangle BCD = 42$ cm². Find

- (a) $\sin \angle CDB$,
- (b) the length of AC ,
- (c) the length of AB ,
- (d) $\cos \angle CBD$.

Ans: (a) $\frac{3}{5}$ (b) 12 cm (c) 9 cm (d) $-\frac{3}{5}$