Trigonometry

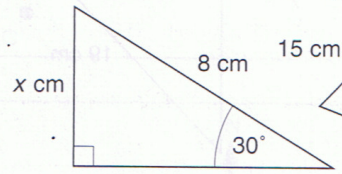
Question Bank

Exercise 1

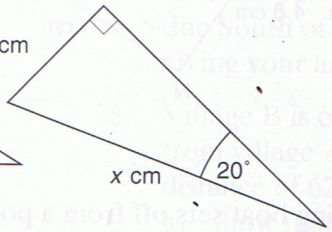
NB: All diagrams are not drawn to scale.

1. Calculate the length of the side marked x cm in each of the following. Give your answers correct to 1 d.p.

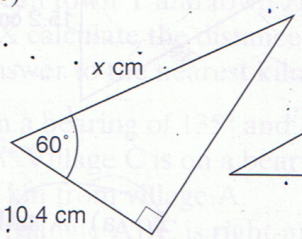
a)



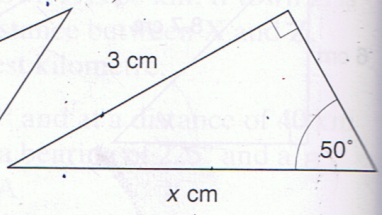
b)



c)

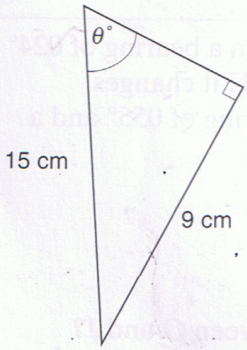


d)

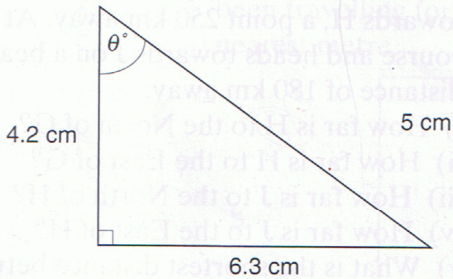


2. Calculate the angle marked $\theta°$ in each of the following. Give your answers correct to the nearest degree.

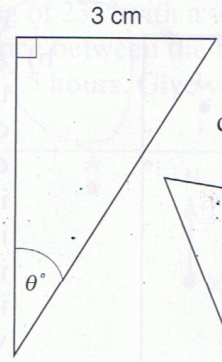
a)



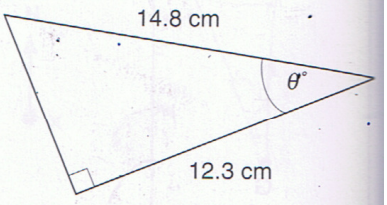
b)



c)

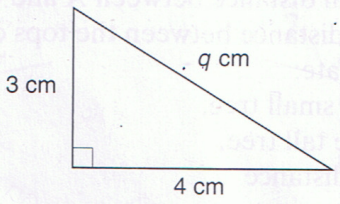


d)

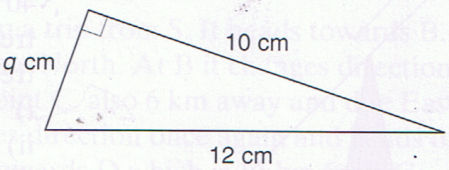


3. Calculate the length of the side marked q cm in each of the following. Give your answers correct to 1 d.p.

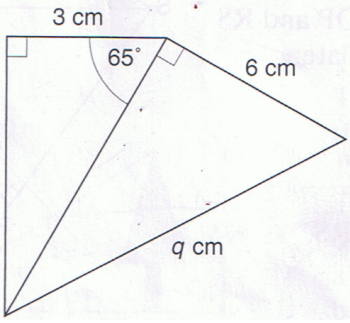
a)



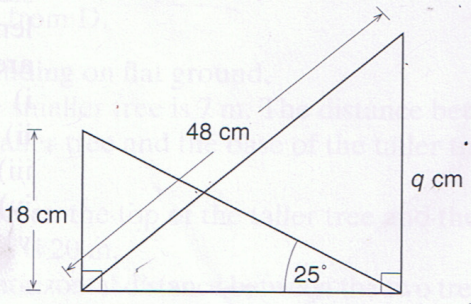
b)



c)



d)

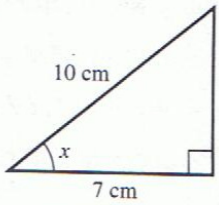


Trigonometry

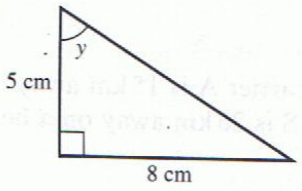
Exercise 2

1. Calculate the side or angle marked with a letter.

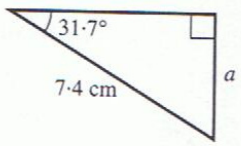
(a)



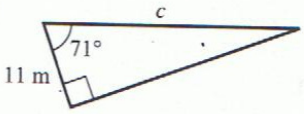
(b)



(c)



(d)



2. Given that x is an acute angle and that

$3 \tan x - 2 = 4 \cos 35{\cdot}3°$

calculate:

(a) $\tan x$

(b) the value of x in degrees correct to 1 D.P.

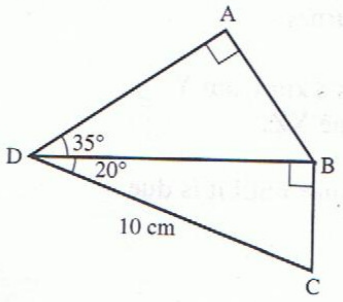
3. In the triangle XYZ, XY = 14 cm, XZ = 17 cm and angle YXZ = 25°. A is the foot of the perpendicular from Y to XZ.
Calculate:

(a) the length XA

(b) the length YA

(c) the angle ZYA

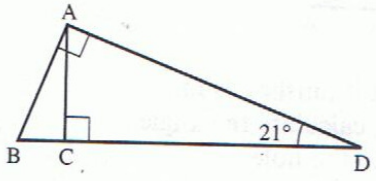
4. Calculate the length of AB.



5. (a) A lies on a bearing of 040° from B.
Calculate the bearing of B from A.

(b) The bearing of X from Y is 115°.
Calculate the bearing of Y from X.

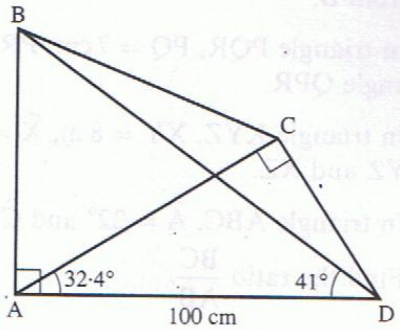
6. Given BD = 1 m, calculate the length AC.



Trigonometry

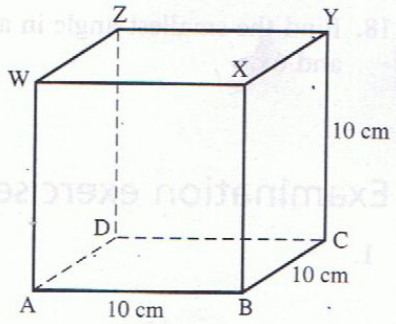
7. In the triangle PQR, angle PQR = 90° and angle RPQ = 31°. The length of PQ is 11 cm. Calculate:
(a) the length of QR
(b) the length of PR
(c) the length of the perpendicular from Q to PR.

8. $B\hat{A}D = D\hat{C}A = 90°$, $C\hat{A}D = 32{\cdot}4°$, $B\hat{D}A = 41°$ and AD = 100 cm.
Calculate:
(a) the length of AB
(b) the length of DC
(c) the length of BD.

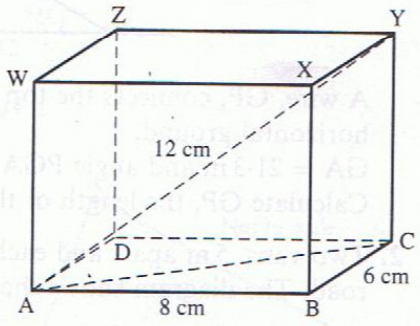


9. An observer at the top of a tower of height 20 m sees a man due East of him at an angle of depression of 27°. He sees another man due South of him at an angle of depression of 30°. Find the distance between the men on the ground.

10. The figure shows a cube of side 10 cm.
Calculate:
(a) the length of AC
(b) the angle YAC
(c) the angle ZBD.



11. The diagram shows a rectangular block.
AY = 12 cm, AB = 8 cm, BC = 6 cm.
Calculate:
(a) the length YC
(b) the angle $Y\hat{A}Z$



12. VABCD is a pyramid in which the base ABCD is a square of side 8 cm; V is vertically above the centre of the square and VA = VB = VC = VD = 10 cm.
Calculate:
(a) the length AC
(b) the height of V above the base
(c) the angle $V\hat{C}A$.

Trigonometry

Questions **13** to **18** may be answered either by scale drawing or by using the sine and cosine rules.

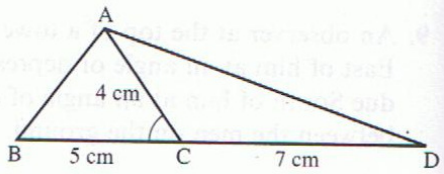
13. Two lighthouses A and B are 25 km apart and A is due West of B. A submarine S is on a bearing of 137° from A and on a bearing of 170° from B. Find the distance of S from A and the distance of S from B.

14. In triangle PQR, PQ = 7 cm, PR = 8 cm and QR = 9 cm. Find angle QPR.

15. In triangle XYZ, XY = 8 m, $\hat{X} = 57°$ and $\hat{Z} = 50°$. Find the lengths YZ and XZ.

16. In triangle ABC, $\hat{A} = 22°$ and $\hat{C} = 44°$.
Find the ratio $\frac{BC}{AB}$.

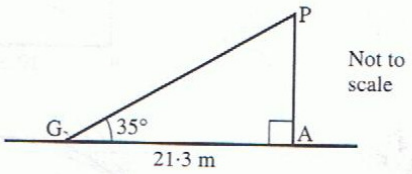
17. Given $\cos A\hat{C}B = 0{\cdot}6$, AC = 4 cm, BC = 5 cm and CD = 7 cm, find the length of AB and AD.



18. Find the smallest angle in a triangle whose sides are of length $3x$, $4x$ and $6x$.

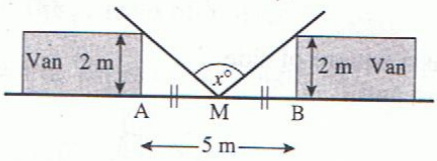
Exercise 3

1.



A wire, GP, connects the top of a vertical pole, AP, to the horizontal ground.
GA = 21·3 m and angle PGA = 35°.
Calculate GP, the length of the wire. J 97 2

2. Two vans, 5 m apart and each 2 m wide, are parked at the side of a road. The diagram shows the vans from above.



(a) A man stands on the pavement at M, halfway between A and B. Calculate his angle of view ($x°$).
(b) Calculate his angle of view if he stood at the point B. N 98 2

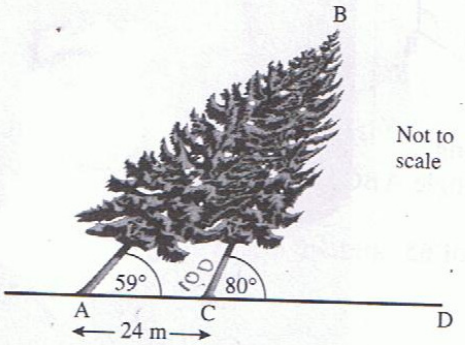
Trigonometry

3. $\cos A = \sqrt{\dfrac{1}{4-2\sqrt{2}}}$

Calculate the value of angle A.

N 98 2

4.

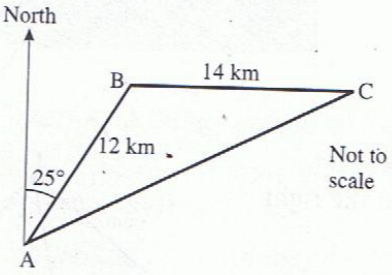


Not to scale

During a storm, a tree, AB, is blown over and rests on another tree CB. $B\hat{A}C = 59°$, $B\hat{C}D = 80°$, AC = 24 m and ACD is horizontal.
Calculate the length AB.

J 95 2

5.

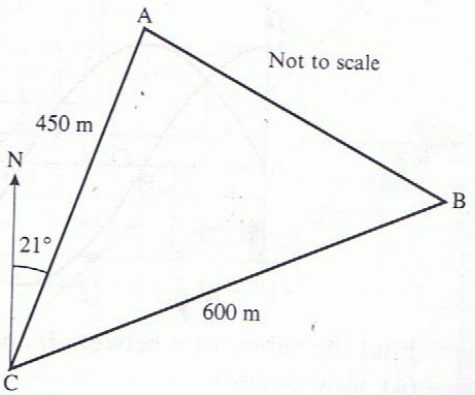


Not to scale

Hussein travels 12 km from A to B on a bearing of 025°.
He then travels due East for 14 km to C.
(a) Show that angle ABC is 115°.
(b) Calculate:
(i) the distance AC,
(ii) the angle BAC,
(iii) the bearing of A from C.

J 97 4

6. The diagram represents three straight roads which surround a village.
The bearing of A from C is 021°. Angle ACB = 41°.
The lengths of the roads CA and CB are 450 m and 600 m respectively.
(a) Calculate the bearing of
(i) B from C,
(ii) C from A.
(b) Calculate how far A is north of C.
(c) Calculate the length of the road AB.
(d) The area ABC contains homes for 374 people.
Calculate the average number of people per hectare in the area. (1 hectare = 10 000 m^2.)



N 95 4