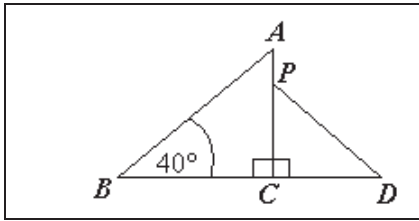


1.

2. Jun 96

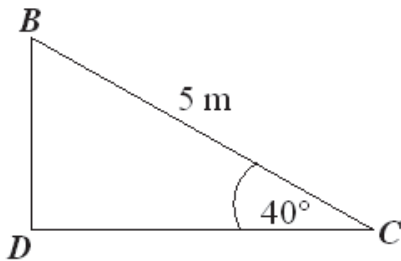
The diagram below, **not drawn to scale**, shows  $ABC$  and  $PCD$  are right angled triangles. Angle  $ABC = 40^\circ$ ,  $AB = 10$  cm,  $PD = 8$  cm and  $BD = 15$  cm.



Calculate, giving your answers correct to 1 decimal place

- i. The length of  $BC$  in centimetres
- ii. The size of angle  $PDC$  in degrees

2. The figure below, **not drawn to scale**,  $BC = 5$  m angle  $BCD = 40^\circ$  and angle  $BDC$  is a right angle



- i. Calculate the length in metres of  $BD$
- ii. Calculate the length in metres of  $DC$
- iii. Prove that the area in  $m^2$  of the triangle  $BDC$  is

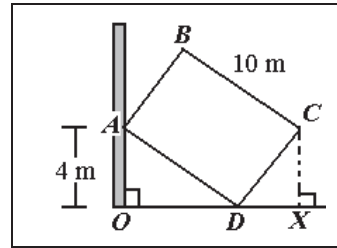
$$12.5 \sin 40^\circ \cos 40^\circ$$

3. A plane takes off at an angle of elevation of  $17^\circ$  to the ground. After 25 seconds the plane has travelled a horizontal distance of 2400 m

- i. Draw a sketch to represent the information.
- ii. Calculate to 2 significant figures the height of the plane above the ground after 25 seconds

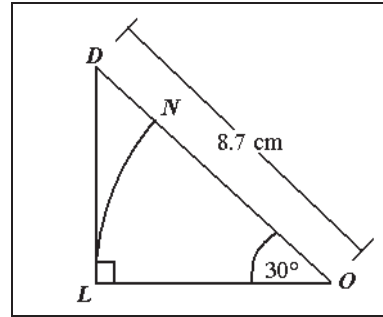
4. The following diagram shows a rectangular sheet of metal,  $ABCD$ , supported by a vertical wall (shaded), which is at right angle to the level ground  $OX$ .  $AB$  measures 3 m and  $AD$

measures 10 m.  $A$  is 4 m above  $O$ .



- i. Calculate the size of angle  $ODA$
- ii. Hence, calculate the size of angle  $CDX$
- iii. If  $CX$  represents the height in metres of  $C$  above the ground, calculate  $CX$ .

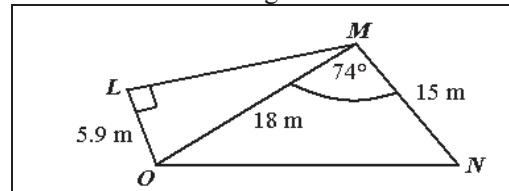
5. In the diagram above, **not drawn to scale**,  $OLN$  is a sector of a circle centre  $O$  and  $ON$  is produced to  $D$ . Angle  $DLO = 90^\circ$ , Angle  $DOL = 30^\circ$  and  $DO = 8.7$  cm.



Calculate

- i. the length of  $DL$
  - ii. the radius of the sector  $OLN$
  - iii. the area of the sector  $OLN$
6. A boy standing on a vertical cliff, 50 m high, is looking down an angle of depression of  $20^\circ$  at a car. How far is the car from the base of the cliff?

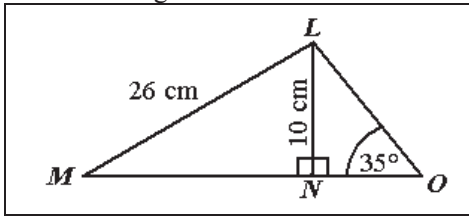
7. The following diagram represents a plot of land,  $LMNO$ , **not drawn to scale**, in which  $LO = 5.9$  m,  $OM = 18$  m,  $MN = 15$  m, angle  $OLM = 90^\circ$  and the angle  $OMN = 74^\circ$



Calculate in metres

- i. the distance  $LM$
  - ii. the distance  $ON$
  - iii. the perimeter of the plot of land
8. The figure below, Not drawn to scale, shows triangle  $LMO$ , with height  $LN = 10$  cm,  $LM =$

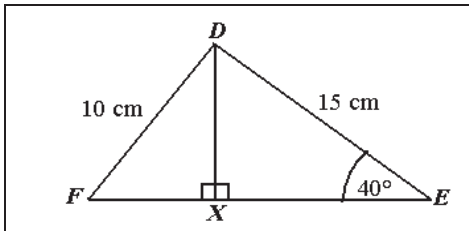
26 cm and angle  $LON = 35^\circ$



Calculate, in cm

- i.  $MN$
- ii.  $MO$

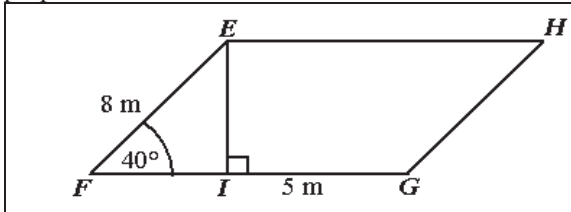
9. In the diagram below, **not drawn to scale**,  $DEF$  is a triangle with  $DE = 15\text{cm}$ ,  $DF = 10\text{cm}$ , angle  $DEF = 40^\circ$ .  $DX$  is perpendicular to  $EF$ .



Calculate

- i. The length in cm of  $DX$
- ii. The size of the angle  $EDF$

10. The diagram below, **not drawn to scale**, represents one face of a roof of a house in the shape of a parallelogram  $EFGH$ . Angle  $EFI = 40^\circ$ .  $EF = 8\text{ m}$ .  $EI$  represents a rafter placed perpendicular to  $FG$  such that  $IG = 5\text{ m}$



Calculate giving your answer to 3 significant figures

- i. the length of  $FI$
- ii. the length of  $EI$
- iii. the area of  $EFGH$

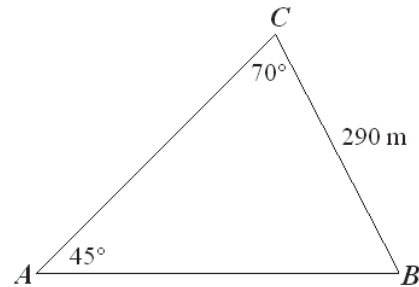
11. A vertical pole stands on horizontal ground. From the top of the pole,  $h$  metres high, the angle of depression of a spot 10 m from the foot of the pole is  $25^\circ$ .
- i. Sketch a diagram to represent this information, showing the pole, the ground and the measurements given.
  - ii. Calculate the value of  $h$ .

12. ;  
13.

14.  
15.  
16.  
17.  
18.

### TRIGONOMETRY 2

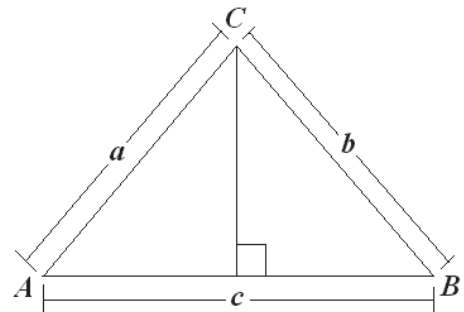
1. Jun 83



The dimensions of a plot of land,  $ABC$ , are such that the angle  $BAC = 45^\circ$ , angle  $ACB = 70^\circ$  and  $BC = 290\text{ m}$ .

Calculate, to two significant figures, the length of  $AB$ .

2. Jun 84

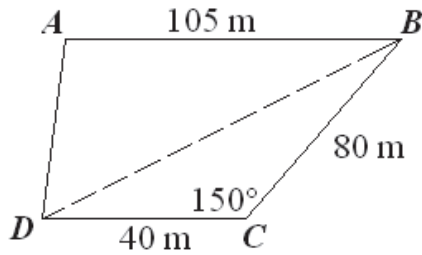


In the triangle  $ABC$  above, angle  $C$  is obtuse and  $CD$  is perpendicular to  $AB$ . Prove that

$$\frac{a}{\sin A} = \frac{b}{\sin B}$$

3. Jun 82

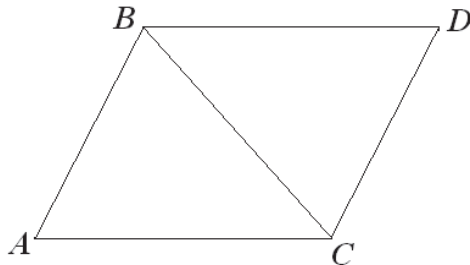
The trapezium  $ABCD$  below (not drawn to scale) is a diagram of a plot of land such that  $AB$  is parallel to  $DC$ .  $DC = 40\text{ m}$ ,  $BA = 105\text{ m}$ ,  $CB = 80\text{ m}$  and angle  $DCB = 150^\circ$



Calculate to 3 significant figures

- a. the length of BD
- b. the area of ABCD

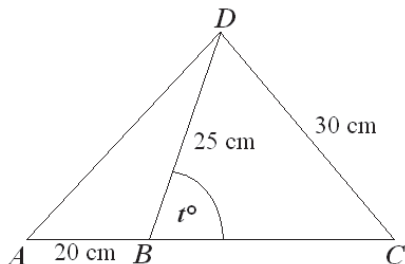
4. Jun 87



In the parallelogram ABCD (not drawn to scale),  $AB = 9$  cm,  $BD = 10$  cm, and the angle  $BCD = 44.4^\circ$

- i. Calculate to the nearest whole number, the size of the angle BDA
- ii. Using the cosine rule, calculate the length of AD

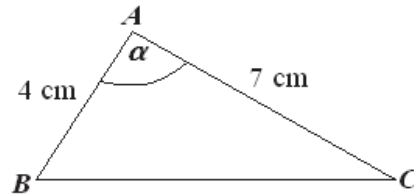
5. Jan 89



In the diagram above(not drawn to scale),  $AB = 20$ ,  $CD = 30$ cm,  $DB = 25$  cm and the angle  $DBC = t^\circ$

- i. Given that  $\cos t^\circ = \frac{7}{25}$ , use the cosine rule, or otherwise, to calculate the length of AD to the nearest cm.
- ii. Write down an expression for  $\sin \angle BCD$  in terms of  $t$  and hence show that  $\sin \angle BCD = \frac{4}{5}$

6. Jun 93

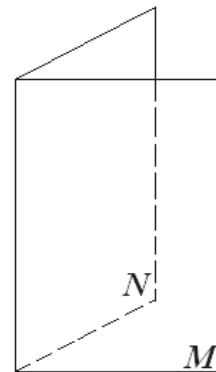


In the triangle ABC above, **not drawn to scale**,  $AB = 4$  cm,  $AC = 7$  cm and angle BAC is .

Given that  $\sin^2 \alpha = 0.64$ , determine

- i. the exact value of  $\cos^2 \alpha$
- ii. the value of  $\alpha$ , if  $90^\circ < \alpha < 180^\circ$
- iii. the length of BC, correct to one decimal place.

7. Jan 97

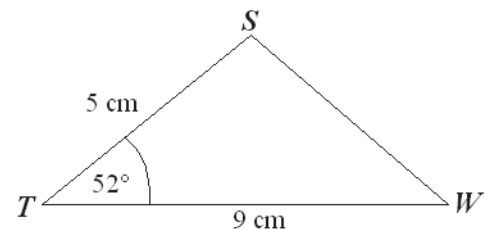


The figure above (not drawn to scale) shows the rectangular cover of a book. The cover is 12 cm long and 8 cm wide and is opened at an angle of  $124^\circ$

Calculate to one decimal place

- i. The length of the diagonal of the cover
- ii. The distance between the corners M and N

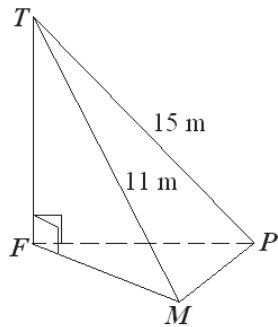
8. Jun 02



In the diagram above (not drawn to scale)  $ST = 5$  cm,  $TW = 9$  cm and angle  $STW = 52^\circ$  calculate

- i. the length of SW
- ii. the area of  $\triangle STW$

9. Jun 85

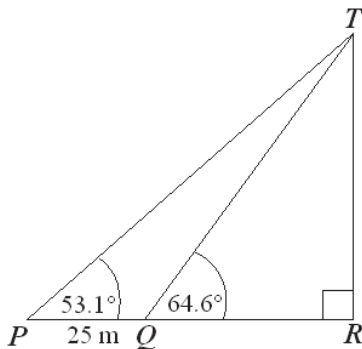


TF is a vertical flagpole, F, M and P are points on the same horizontal plane. Two ropes TP and TM are attached to the top of the pole. The angles of depression of M and of P from T are  $60^\circ$  and  $40^\circ$  respectively.  $TP = 15$  m, and  $TM = 11$  m, and angle  $PFM = 45^\circ$ .

Calculate the length of

- a. PF
- b. MP

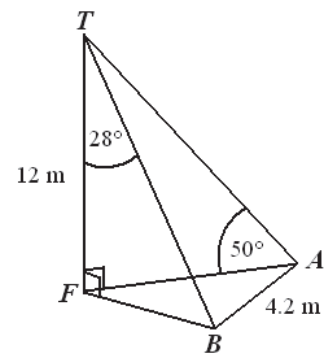
10. Jun 87



The diagram above (not drawn to scale) shows the angles of elevation of T, the top of a vertical mast from the points P and Q from the same side of R on a horizontal plane. P, Q and R lie on a straight line.  $PQ = 25$  meters, angles  $TPQ$  and  $TQR$  are  $53.1^\circ$  and  $64.6^\circ$  respectively.

- i. Show that the length of QT is 100 metres to the nearest metre.
- ii. Hence or otherwise calculate the height of the mast.

11. Jan 01



The diagram above (not drawn to scale) shows a pole  $TF$  12 m high, standing on level ground. The points  $A$ ,  $F$ , and  $B$  lie on the same horizontal plane.

$AB = 4.2$  m,  $B\hat{T}F = 28^\circ$ , and  $T\hat{A}F = 50^\circ$ .

$T\hat{F}B$  and  $T\hat{F}A$  are right angles.

- a. Calculate
  - i. the lengths of  $FB$  and  $FA$  giving your answer to three significant figures
  - ii. the size of  $A\hat{F}B$ , to the nearest degree
  - iii. the bearing of  $B$  from  $F$ .\*\*
- b. Given that the area of triangle  $BTA = 28.1$  m<sup>2</sup> and  $AT = 15.7$  m, calculate the size of  $B\hat{T}A$ .