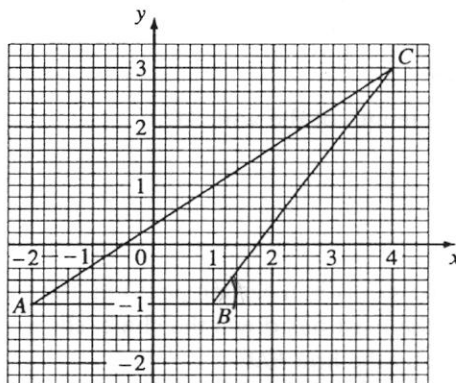


PAST EXAMINATION QUESTIONS

1. The diagram shows three points, $A(-2, -1)$, $B(1, -1)$ and $C(4, 3)$.

Calculate

- the area of triangle ABC ,
- the cosine of \hat{BC} .



(N99/1/16)

2.

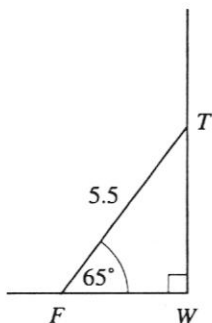


Diagram I

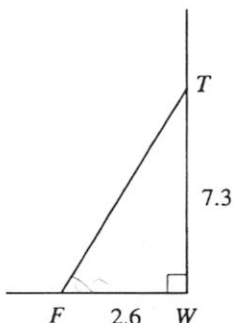


Diagram II

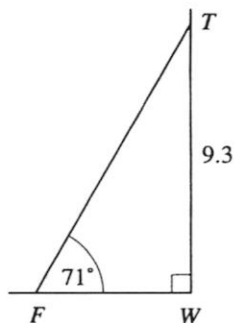


Diagram III

A ladder FT stands on horizontal ground at F and leans against a vertical wall at T . The point W , on the ground, is vertically below T . The ladder can be extended to various lengths. The diagrams above show three positions of this ladder.

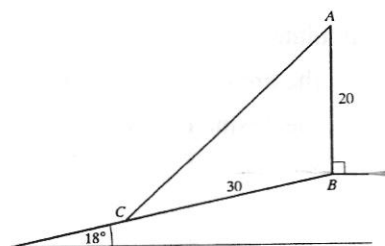
- In Diagram I, $FT = 5.5$ m and $\hat{TFW} = 65^\circ$. Calculate FW .
- In Diagram II, $TW = 7.3$ m and $FW = 2.6$ m. Calculate the angle which the ladder makes with the ground.
- In Diagram III, $TW = 9.3$ m and $\hat{TFW} = 71^\circ$. Calculate by how much the ladder has been extended from its original length of 5.5 m.

(N99/2/1)

3. A radio mast AB , of height 20 m, stands at the top of a slope which is inclined at 18° to the horizontal.

- (a) The mast is supported by a wire AC attached to a point C on the slope, where $BC = 30$ m. Calculate

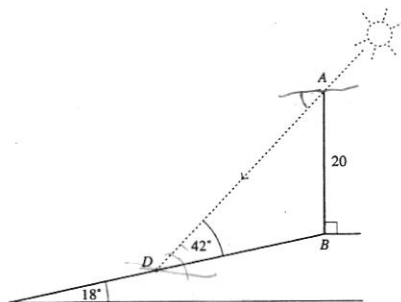
- (i) \hat{ABC} ,
(ii) the length of the wire AC .



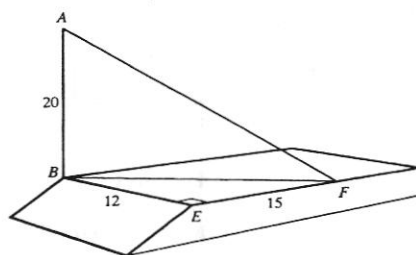
- (b) When the sun is in a certain position, the shadow cast by the mast lies down the slope, shown in the diagram by the line BD .

Given that $\hat{ADB} = 42^\circ$, calculate

- (i) the angle of elevation of the sun,
(ii) \hat{DAB} ,
(iii) the length of the shadow BD .



- (c) The mast is supported by another wire AF . The points B , E and F lie on horizontal ground. Given that $\hat{BEF} = 90^\circ$, $BE = 12$ m and $EF = 15$ m, calculate the length of the wire AF .

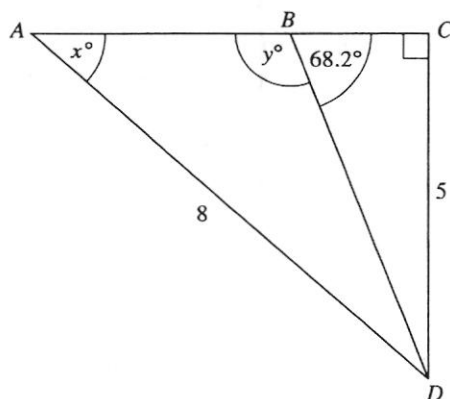


(N99/2/9)

4. In the diagram, ABC is a straight line, $\hat{CBD} = 68.2^\circ$, $\hat{BCD} = 90^\circ$, $CD = 5$ cm and $AD = 8$ cm. Using as much of the information given in the table below as is necessary, find

	\sin	\cos	\tan
68.2°	0.93	0.37	2.50

- (a) $\sin x$, giving your answer as a fraction,
(b) $\cos y$,
(c) BC .



(N2000/1/1)

5. The diagram shows two horizontal triangular fields, ABC and ACD which are surrounded by hedges. It is given that DAB is a straight line, $AC = 65$ m, $\hat{CAB} = 60^\circ$ and $\hat{ABC} = 72^\circ$.

(a) Calculate the length of the hedge BC .

(b) The hedge AD has length 84 m.

Calculate

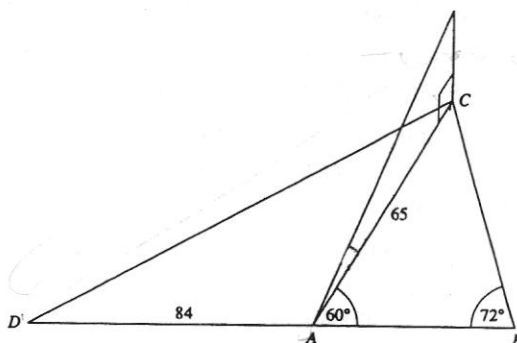
(i) the area of the field ACD ,

(ii) the length of the hedge CD .

(c) A vertical tree is growing at C .
The angle of elevation of the top of the tree from A is 14° .

(i) Calculate the height of the tree.

(ii) A boy has climbed exactly half way up the tree. Calculate the angle of depression of D when viewed by the boy. (N2000/2/8)



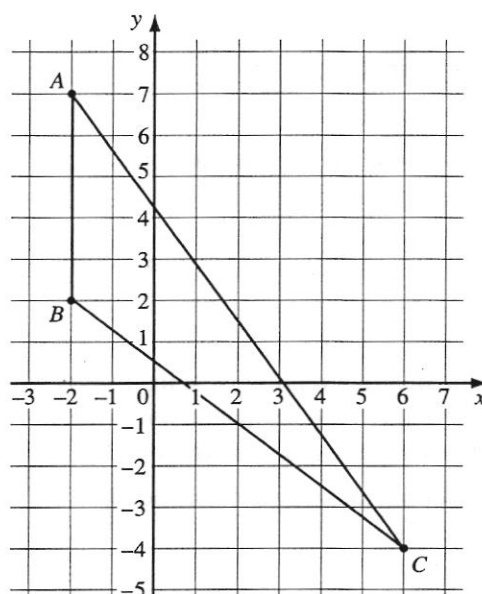
6. The diagram shows three points, $A(-2, 7)$, $B(-2, 2)$ and $C(6, -4)$.

Find

(a) the length BC ,

(b) the area of triangle ABC ,

(c) the value of $\sin \hat{ABC}$.



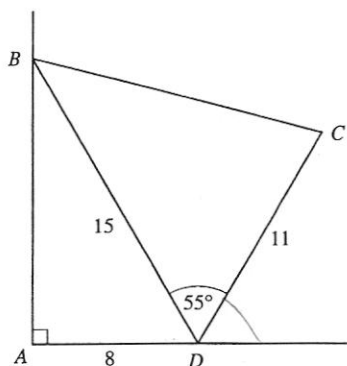
(N2001/1/21)

7. In the diagram, AB is a vertical wall. A beam, CD , of length 11 metres, rests with one end, D , on horizontal ground. It is held in place by two cables, BC and BD . Given that $AD = 8$ metres, $BD = 15$ metres and angle $BDC = 55^\circ$, calculate

(a) the length of AB ,

(b) the length of the cable BC ,

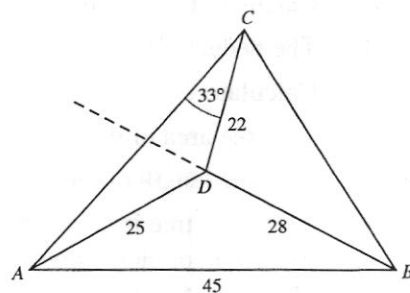
(c) the angle between the beam CD and the ground.



(N2001/2/1)

8. The diagram shows four points, A , B , C and D , on a piece of horizontal land. It is given that $AB = 45$ metres, $AD = 25$ metres and $BD = 28$ metres.

- Calculate angle ADB .
- Given also that $CD = 22$ metres and that angle $ACD = 33^\circ$, calculate angle ADC .
- The line BD is produced beyond D . Calculate the shortest distance from C to this extended line.
- D is the foot of a vertical mast, DT . The angle of elevation of the top of the mast, T , from A is 40° . Calculate the angle of elevation of T from B .



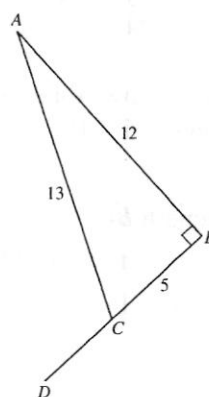
(N2002/2/8)

9. In the diagram, BCD is a straight line, $BC = 5$ cm, $AB = 12$ cm, $AC = 13$ cm and $\hat{A}BC = 90^\circ$.

Find

- $\tan \hat{B}AC$,
- $\cos \hat{A}CD$.

Give both answers as fractions.

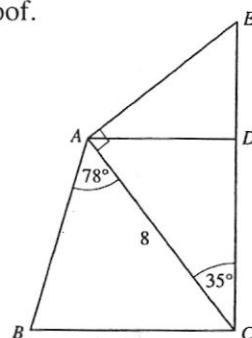


(N2004/1/8)

10. The diagram represents some beams which support part of a roof. AD and BC are horizontal and CDE is vertical. $AC = 8$ metres, $\hat{B}AC = 78^\circ$, $\hat{A}CD = 35^\circ$ and $\hat{C}AE = 90^\circ$.

Calculate the length of the beam

- AD ,
- CE ,
- AB .

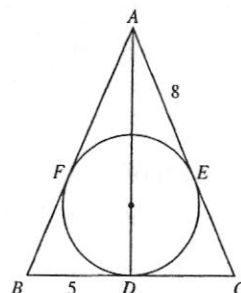


(N2004/2/1)

11. (a) The diagram shows a circle which passes through D , E and F . AFB , BDC and CEA are tangents to the circle. D is the midpoint of BC .

Given that $BD = 5$ cm and $AE = 8$ cm, find

- EC ,
- $\hat{C}AD$.

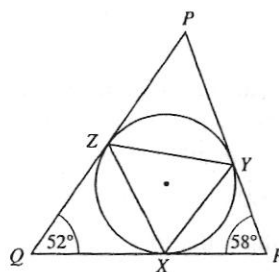


- (b) The diagram shows a circle which passes through X , Y and Z .

PZQ , QXR and RYP are tangents to the circle.

Given that $\angle PQR = 52^\circ$ and $\angle QRP = 58^\circ$, calculate

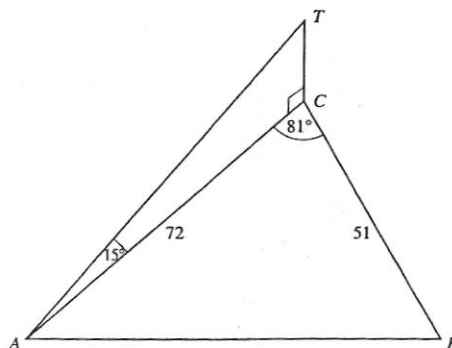
- $\angle QPR$,
- $\angle QZX$,
- $\angle ZXY$.



(N2004/2/5)

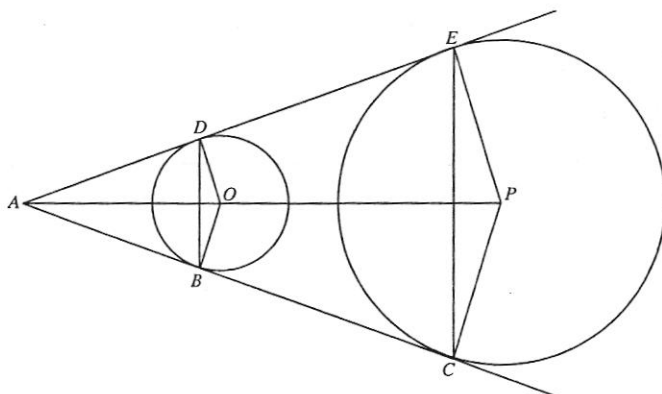
12. Three paths, AB , BC and CA , run along the edges of a horizontal triangular field ABC . $BC = 51$ m, $AC = 72$ m and angle $ACB = 81^\circ$.

- Calculate the length of AB .
- Calculate the area of the field ABC .
- Calculate the shortest distance from C to AB .
- A vertical tree, CT , has its base at C . The angle of elevation of the top of the tree from A is 15° . Calculate the height of the tree.



(N2004/2/7)

13.



The diagram shows two circles with centres O and P .

ABC and ADE are tangents to the circles at B , C , D and E as shown.

AOP is a straight line.

- Giving a reason for your answer, write down angle ABO .
- It is given that $OB = 6$ cm, $AO = 13$ cm and $PC = 15$ cm.
 - Show that angle $OAB = 27.5^\circ$, correct to one decimal place.
 - Calculate AC .
 - Calculate CE .

(N2005/2/1)

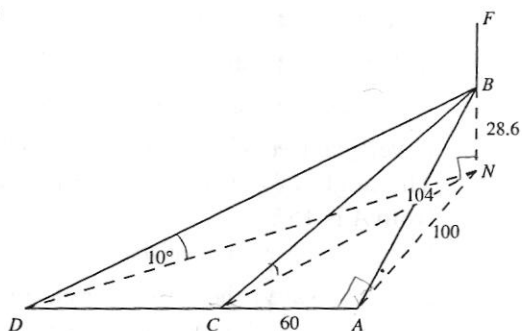
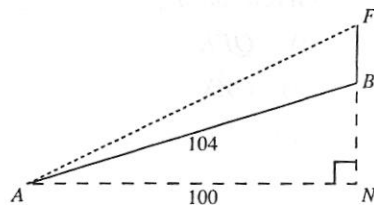
14. A vertical flagpole, BF , stands at the top of a hill.

AB is the steepest path up the hill.

N lies vertically below B and $\hat{A}NB = 90^\circ$.

$AN = 100$ m and $AB = 104$ m.

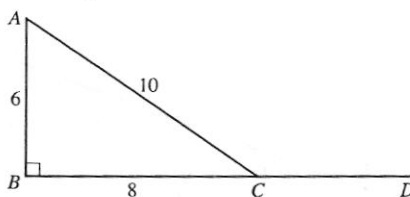
- (a) Show that $BN = 28.6$ m.
- (b) It is given that $\hat{F}AN = 25^\circ$.
 - (i) Write down the size of the angle of depression of A from F .
 - (ii) Calculate the height, BF , of the flagpole.
- (c) The diagram shows three other straight paths (CB , DB and ACD) on the hill. The path ACD is horizontal and $\hat{B}AC = \hat{N}AC = 90^\circ$. CN and DN are horizontal lines.
 - (i) Given that $AC = 60$ m, calculate $\hat{B}CN$.
 - (ii) Given that $\hat{B}DN = 10^\circ$, calculate $\hat{D}BA$.



(N2006/2/9)

15. In the triangle ABC , angle $ABC = 90^\circ$ and BC is produced to D .

- (a) Write down $\cos \hat{A}CD$.
- (b) Calculate the perpendicular distance from B to AC .



(N2007/1/12)