

Firrhill High
Mathematics Department

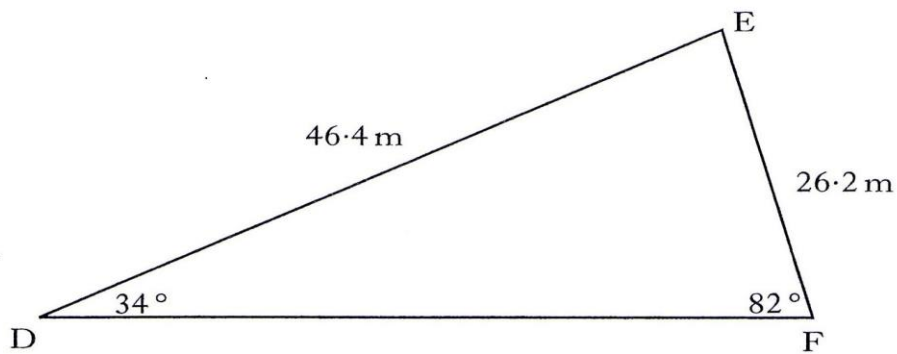
Level 5

Assessment Questions

Trigonometry

(1) 2010 Paper 2 Q.8

As part of their training, footballers run around a triangular circuit DEF.



- $\angle EDF = 34^\circ$
- $\angle DFE = 82^\circ$
- $DE = 46.4$ metres
- $EF = 26.2$ metres

How many **complete** circuits must they run to cover **at least** 1000 metres?

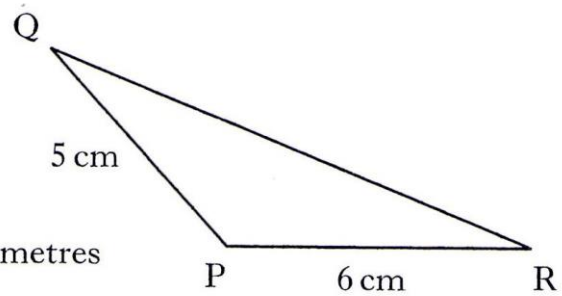
KU	RE
	4

(2) 2010 Paper 2 Q.10

In triangle PQR:

- $PQ = 5$ centimetres
- $PR = 6$ centimetres
- area of triangle PQR = 12 square centimetres
- angle QPR is **obtuse**.

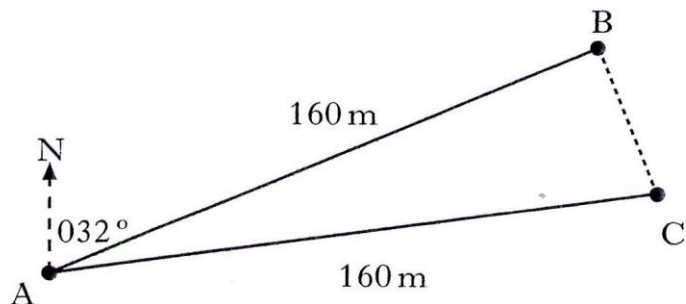
Calculate the size of angle QPR.



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(3) 2009 Paper 2 Q.9

Jane is taking part in an orienteering competition.



She should have run 160 metres from A to B on a bearing of 032°.

However, she actually ran 160 metres from A to C on a bearing of 052°.

- (a) Write down the size of angle BAC.
- (b) Calculate the length of BC.
- (c) What is the bearing from C to B?

1

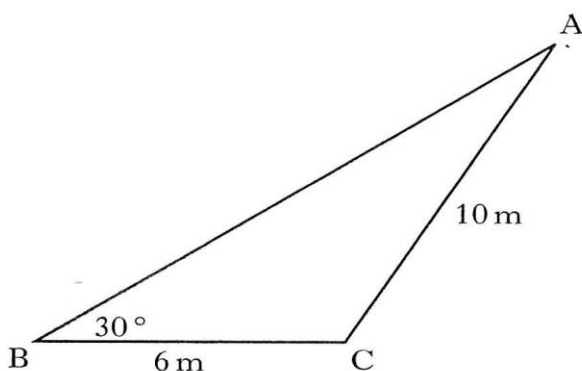
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2

(4) 2009 Paper 1 Q.11

In triangle ABC:

- BC = 6 metres
- AC = 10 metres
- angle ABC = 30°.

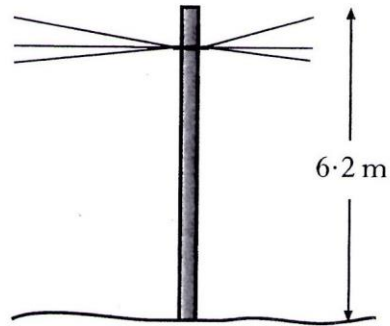


Given that $\sin 30^\circ = 0.5$, show that $\sin A = 0.3$.

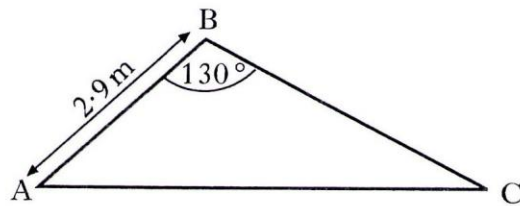
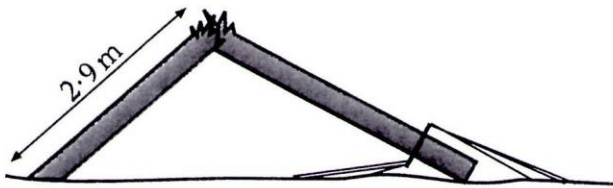
KU	RE
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(5) 2008 Paper 2 Q.7

A telegraph pole is 6.2 metres high.



The wind blows the pole over into the position as shown below.



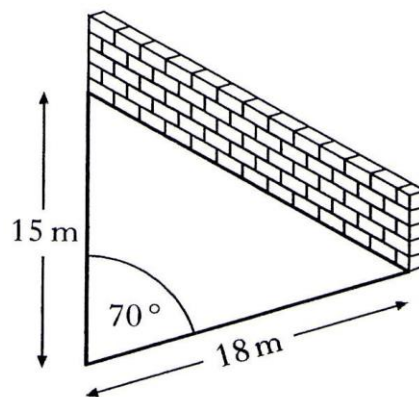
AB is 2.9 metres and angle ABC is 130° .

Calculate the length of AC.

4

(6) 2008 Paper 2 Q.8

A farmer builds a sheep-pen using two lengths of fencing and a wall.



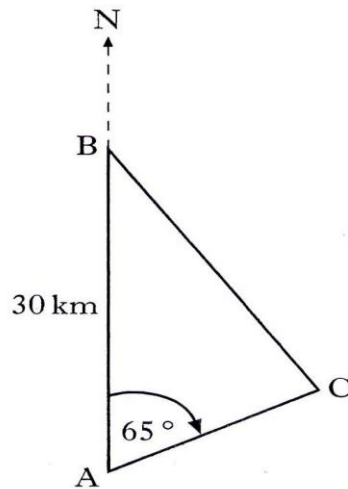
The two lengths of fencing are 15 metres and 18 metres long.

- (a) Calculate the area of the sheep-pen, when the angle between the fencing is 70° .
- (b) What angle between the fencing would give the farmer the largest possible area?

KU	RE
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(7) 2007 Paper 2 Q.6

Brunton is 30 kilometres due North of Appleton.
From Appleton, the bearing of Carlton is 065° .
From Brunton, the bearing of Carlton is 153° .



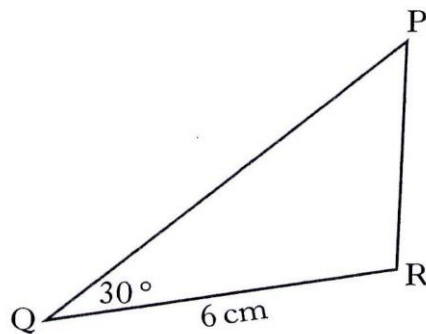
Calculate the distance between Brunton and Carlton.

4

(8) 2008 Paper 2 Q.8

In triangle PQR:

- $QR = 6$ centimetres
- angle $PQR = 30^\circ$
- area of triangle PQR = 15 square centimetres.



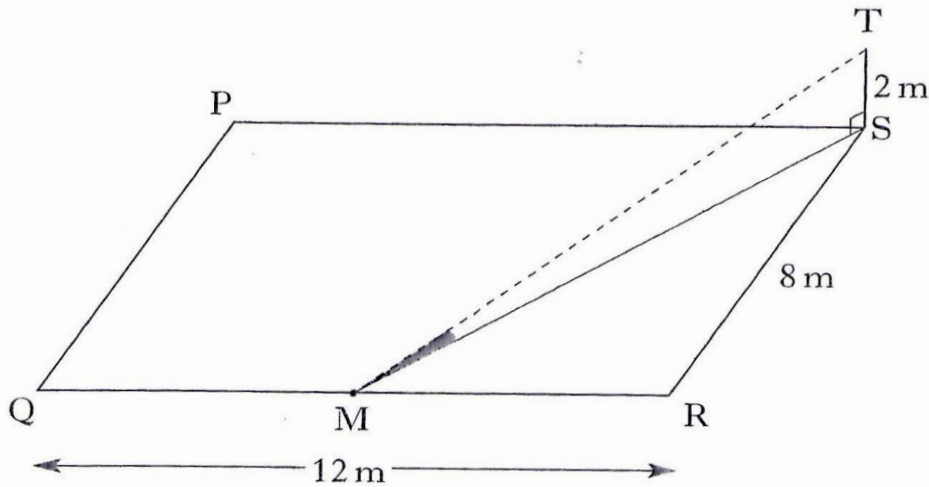
Calculate the length of PQ.

3

(9) 2006 Paper 2 Q.5

ST, a vertical pole 2 metres high, is situated at the corner of a rectangular garden, PQRS.

RS is 8 metres long and QR is 12 metres long.



The pole casts a shadow over the garden.

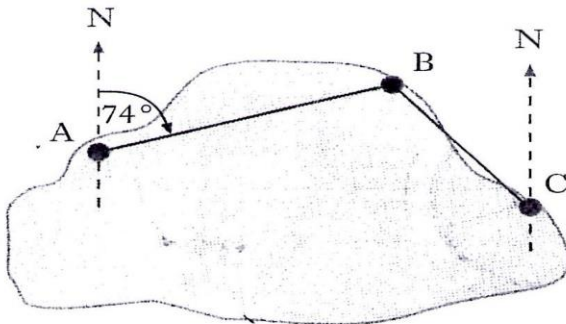
The shadow reaches M, the midpoint of QR.

Calculate the size of the shaded angle TMS.

4

(10) 2006 Paper 2 Q.6

(a) There are three mooring points A, B and C on Lake Sorling.



From A, the bearing of B is 074° .

From C, the bearing of B is 310° .

Calculate the size of angle ABC.

2

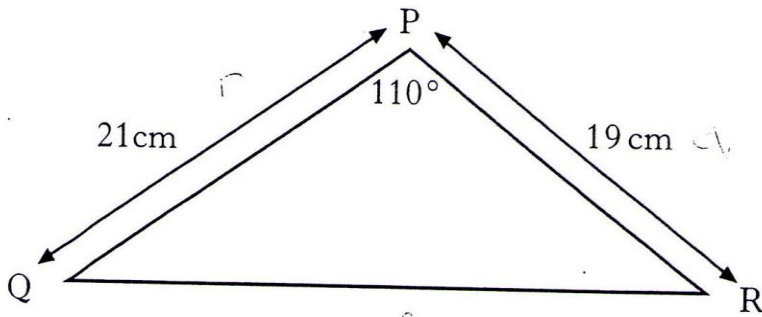
(b) B is 230 metres from A and 110 metres from C.

Calculate the direct distance from A to C.

Give your answer to 3 significant figures.

4

(11) 2005 Paper 2 Q.3



Calculate the area of triangle PQR.

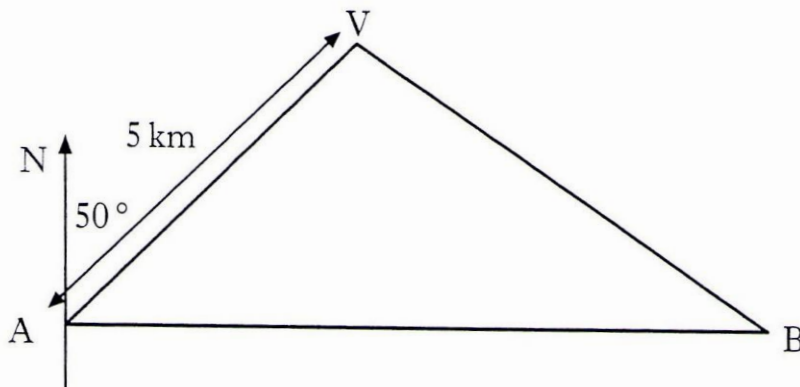
4

(12) 2005 Paper 2 Q.7

David walks on a bearing of 050° from hostel A to a viewpoint V, 5 kilometres away.

Hostel B is due east of hostel A.

Susie walks on a bearing of 294° from hostel B to the same viewpoint.

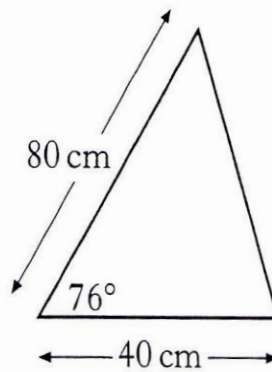
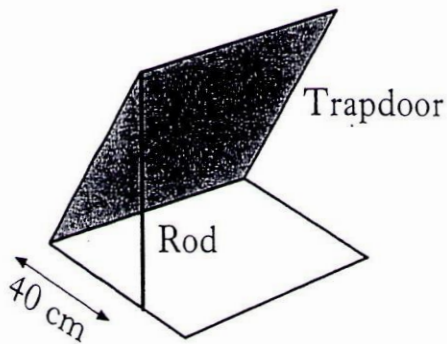


Calculate the length of AB, the distance between the two hostels.

KU	RE
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(15) 2004 Paper 2 Q.7

A square trapdoor of side 80 centimetres is held open by a rod as shown.



The rod is attached to a corner of the trapdoor and placed 40 centimetres along the edge of the opening.

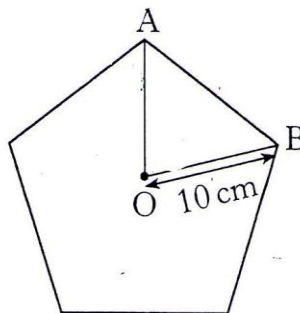
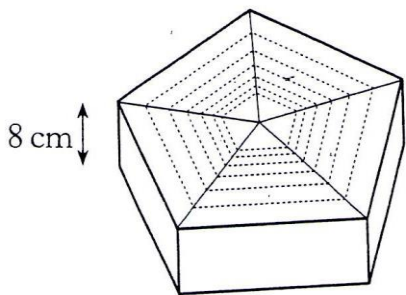
The angle between the trapdoor and the opening is 76° .

Calculate the length of the rod to **2 significant figures**.

4

(16) 2004 Paper 2 Q.9

A gift box, 8 centimetres high, is prism shaped.



The uniform cross-section is a regular pentagon.

Each vertex of the pentagon is 10 centimetres from the centre O.

Calculate the volume of the box.

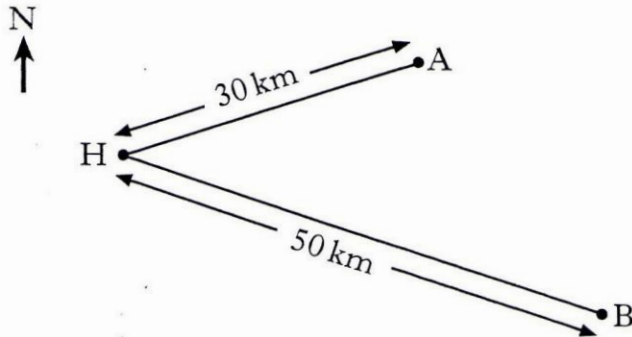
5

(17) 2003 Paper 2 Q.3

Two yachts leave from harbour H.

Yacht A sails on a bearing of 072° for 30 kilometres and stops.

Yacht B sails on a bearing of 140° for 50 kilometres and stops.



How far apart are the two yachts when they have both stopped?

Do not use a scale drawing.

4

(18) 2003 Paper 2 Q.6

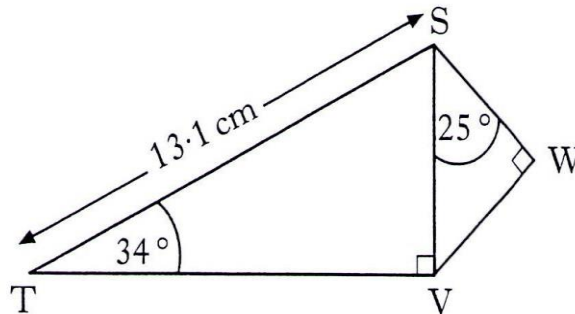
In the diagram,

Angle $STV = 34^\circ$

Angle $VSW = 25^\circ$

Angle $SVT = \text{Angle } SWV = 90^\circ$

$ST = 13.1$ centimetres.



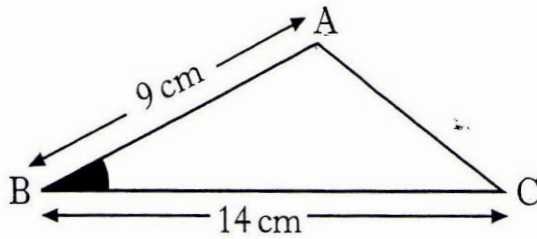
Calculate the length of SW.

4

(19) 2003 Paper 2 Q.7

The area of triangle ABC is 38 square centimetres.

AB is 9 centimetres and BC is 14 centimetres.



Calculate the size of the acute angle ABC.

KU	RE
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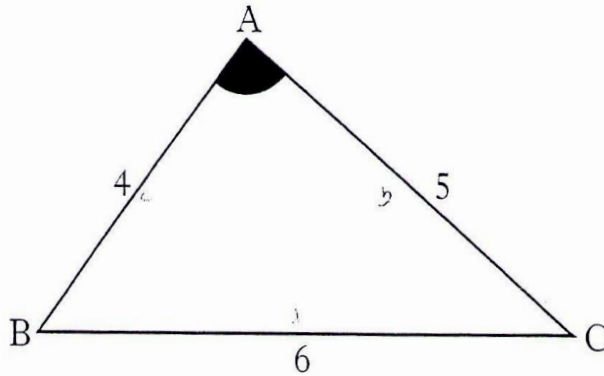
(20) 2002 Paper 1 Q.7

In triangle ABC,

AB = 4 units

AC = 5 units

BC = 6 units.

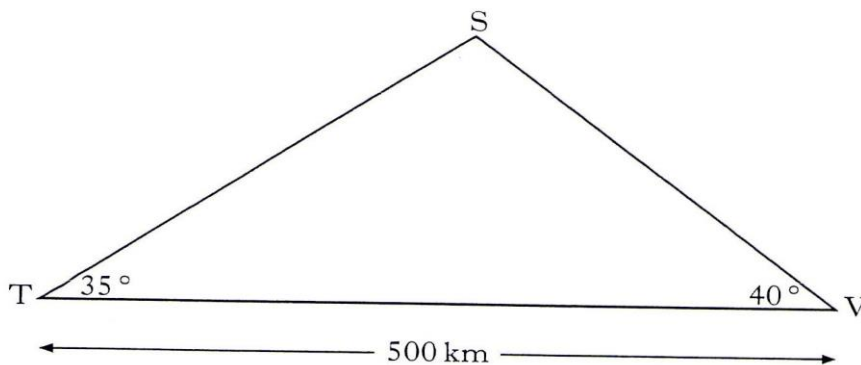


Show that $\cos A = \frac{1}{8}$.

KU	RE
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(21) 2002 Paper 2 Q.4

A TV signal is sent from a transmitter T, via a satellite S, to a village V, as shown in the diagram. The village is 500 kilometres from the transmitter.



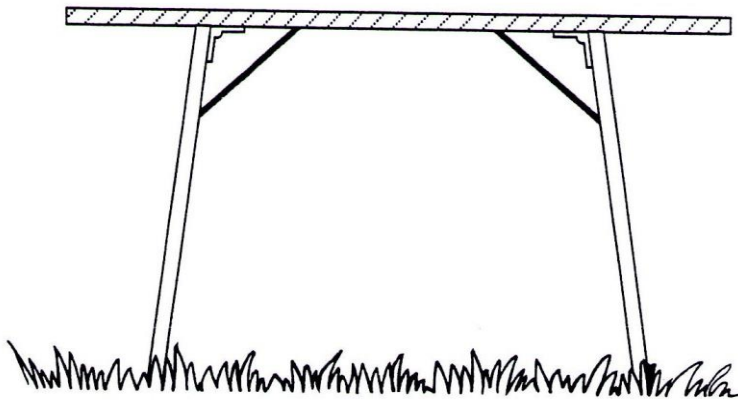
The signal is sent out at an angle of 35° and is received in the village at an angle of 40°.

Calculate the height of the satellite above the ground.

KU	RE
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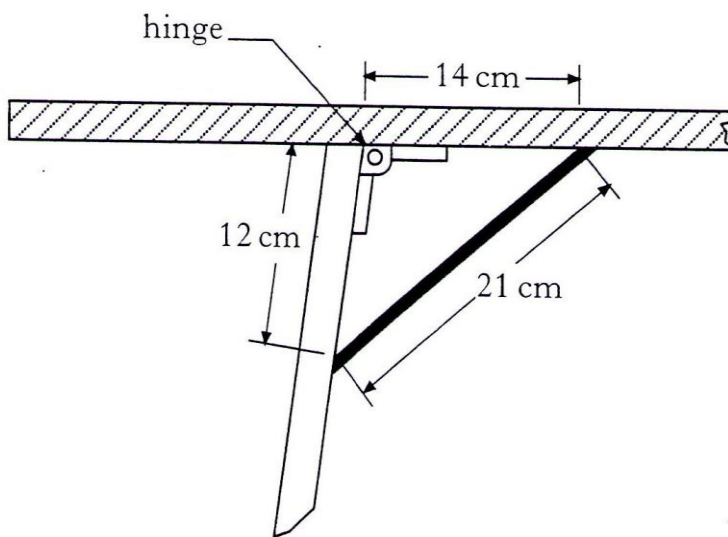
(24) 2001 Paper 2 Q.10

- Each leg of a folding table is prevented from opening too far by a metal bar.



The metal bar is 21 centimetres long.

It is fixed to the table **top** 14 centimetres from the hinge and to the table **leg** 12 centimetres from the hinge.

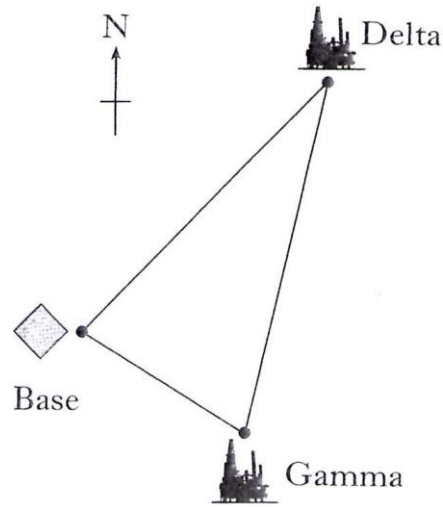


- Calculate the size of the obtuse angle which the table top makes with the leg.
- Given that the table leg is 70 centimetres long, calculate the height of the table.

KU	RE
3	3

(27) 1999 Paper 2 Q.3

The diagram shows the positions of a helicopter base and two oil rigs, Delta and Gamma.



From the helicopter base, the oil rig Delta is 35 kilometres away on a bearing of 050° .

From the same base, the oil rig Gamma is 20 kilometres away on a bearing of 125° .

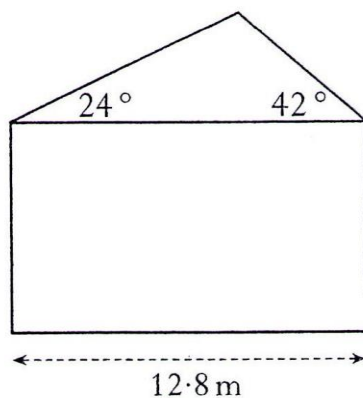
Calculate the distance between Delta and Gamma.

Do not use a scale drawing.

5

(28) 1999 Paper 2 Q.9

The end wall of a bungalow is in the shape of a rectangle and a triangle as shown below.



The roof has one edge inclined at 24° to the horizontal and the other edge inclined at 42° to the horizontal.

The width of the house is 12.8 metres.

Calculate the length of the longer sloping edge of the roof.

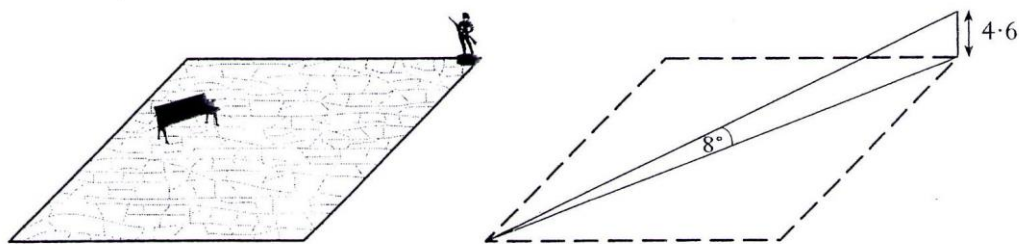
Do not use a scale drawing.

KU RE

4

(29) 1999 Paper 2 Q.10

A statue stands at the corner of a square courtyard.



The statue is 4.6 metres high.

The angle of elevation from the opposite corner of the courtyard to the top of the statue is 8° .

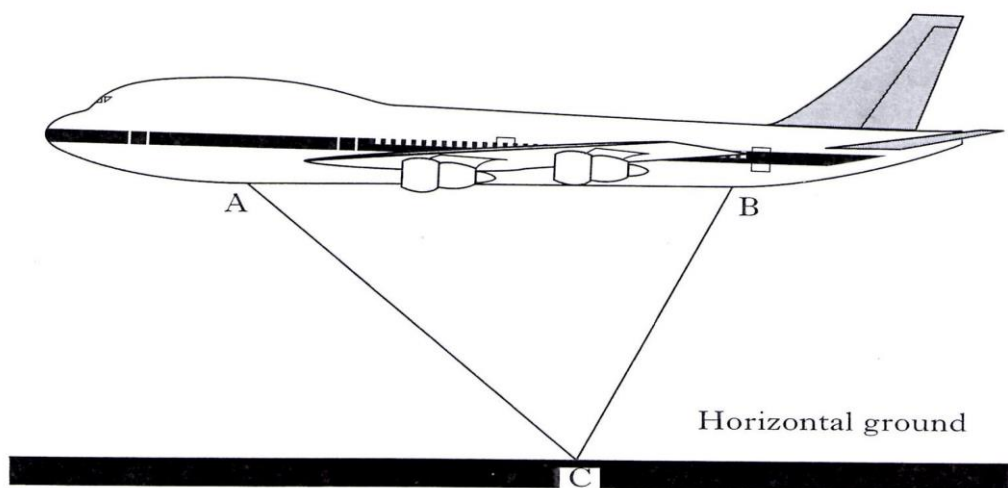
- (a) Find the distance from the base of the statue to the opposite corner of the courtyard.
- (b) Show that the length of the side of the courtyard is approximately 23 metres.

2

3

(30) 1998 Paper 2 Q.6

An aeroplane is flying parallel to the ground.



Lights have been fitted at A and B as shown in the diagram.

When the aeroplane is flying at a certain height, the beams from these lights meet exactly on the ground at C.

The angle of depression of the beam of light from A to C is 50° .

The angle of depression of the beam of light from B to C is 70° .

The distance AB is 20 metres.

Find the height of the aeroplane above C.

6