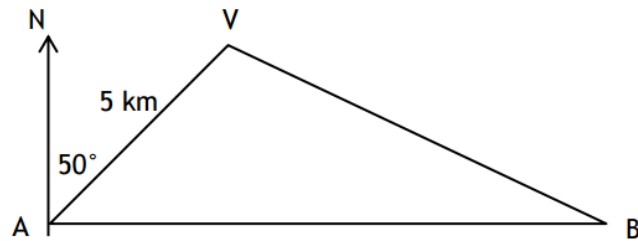David walks on a bearing of 050° from hostel A to viewpoint V, 5 kilometres away.

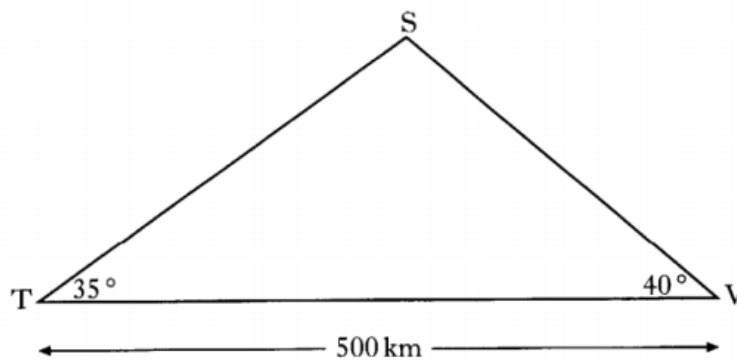Hostel B is due east of hostel A.

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

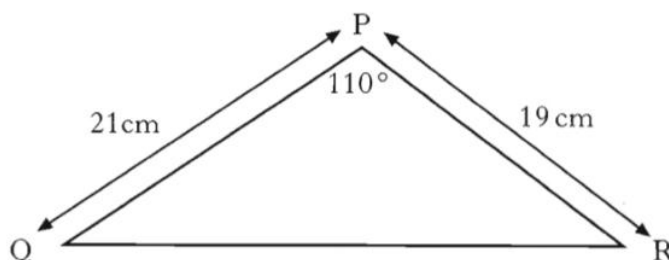Calculate the length of AB, the distance between the two hostels. 5

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. 5
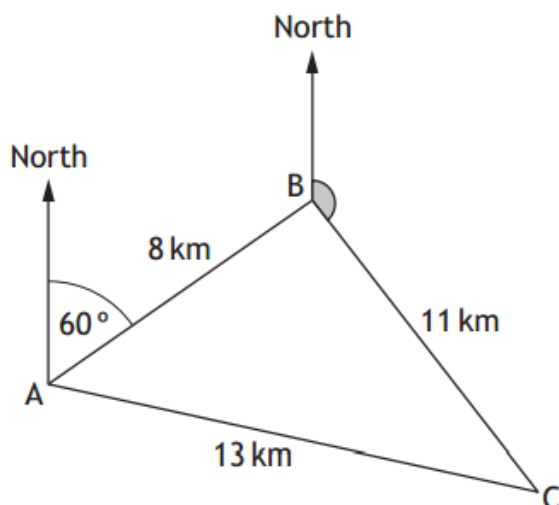

Calculate the area of triangle PQR. 4

In a race, boats sail round three buoys represented by A, B, and C in the diagram below.

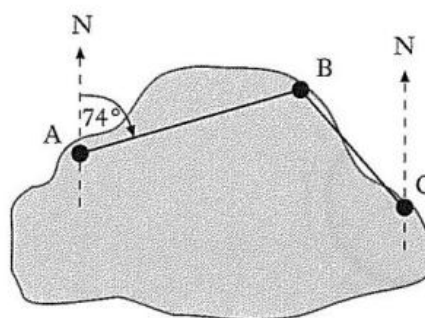B is 8 kilometres from A on a bearing of 060°.

C is 11 kilometres from B.

A is 13 kilometres from C.

(a) Calculate the size of angle ABC.   3

There are three mooring points on Lake Sorling.

- o From A, the bearing of B is 074°.
- o From C, the bearing of B is 310°.
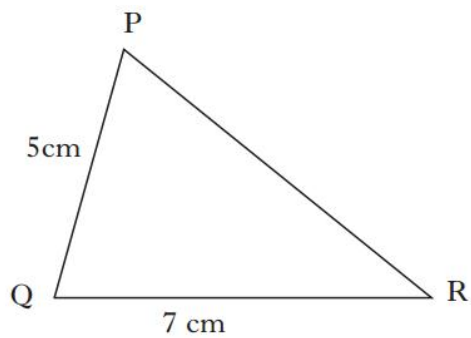
(a)   Calculate the size of angle ABC.   2

B is 230 metres from A and 110 metres from C.

(b)   Calculate the direct distance from A to C.
       Give your answer to 3 significant figures.   4

In triangle PQR, PQ = 5 centimetres, QR = 7 centimetres and $\cos Q = \dfrac{1}{5}$.
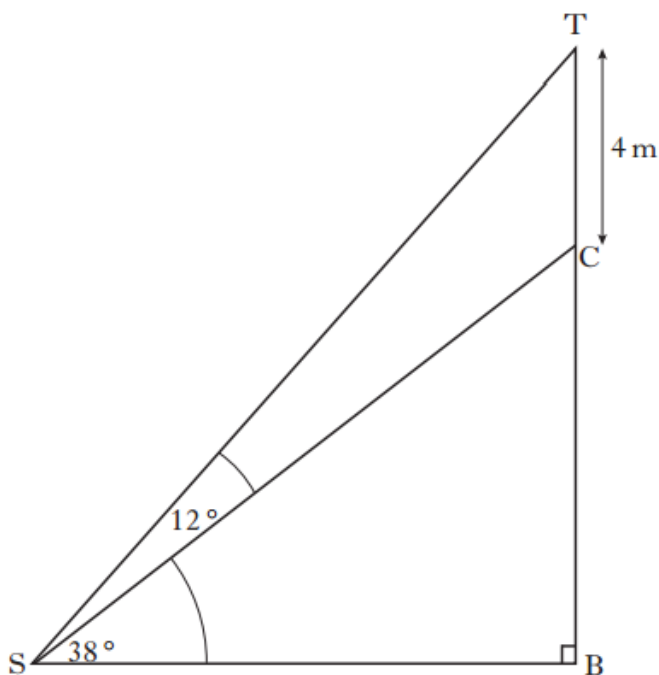
Calculate the length of side PR.

Give your answer in the form $\sqrt{a}$.

3

A tree surgeon is asked to reduce the height of a tree.

In the diagram below TB represents the original height of the tree and C is the point where the cut is to be made.

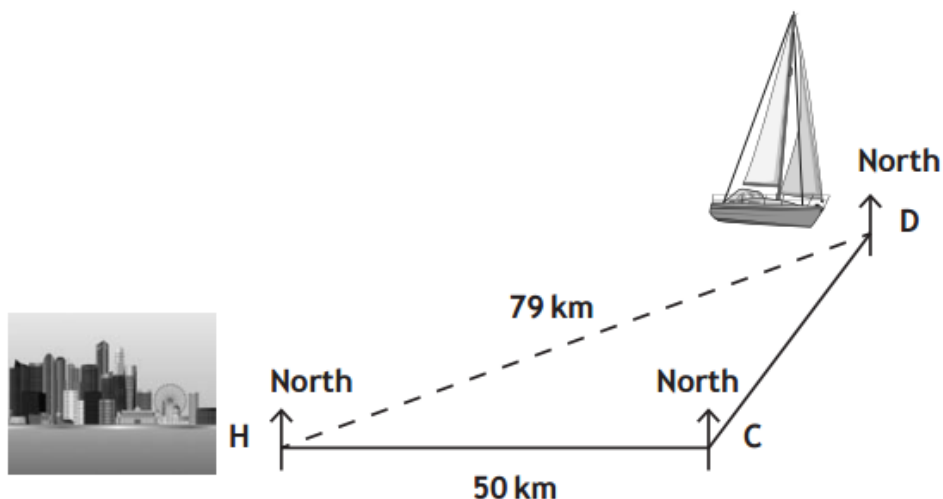The tree surgeon will reduce the height of the tree by 4 metres.

Angle TSC = 12° and angle BSC = 38°.

Calculate the height of the tree after it has been cut.

Do not use a scale drawing.

5

A yacht sails from a harbour H to a point C, then to a point D as shown below.

North

D

**79 km**

North

North

H

C

50 km

C is 50 kilometres due east of H.

D is on a bearing of 040° from C and is 79 kilometres from H.

(a) Calculate the size of angle CDH. 4

(b) Hence, calculate the bearing on which the yacht must sail to return directly to the harbour. 2

Two ships have located a wreck on the sea bed.

In the diagram below, the points P and Q represent the two ships and the point R represents the wreck.

Surface of sea P 350 m Q

27° S 42°

Sea bed

R
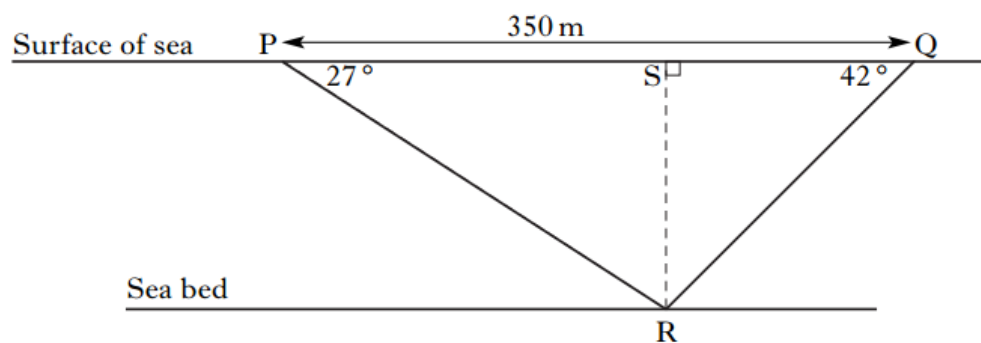
The angle of depression of R from P is 27°.
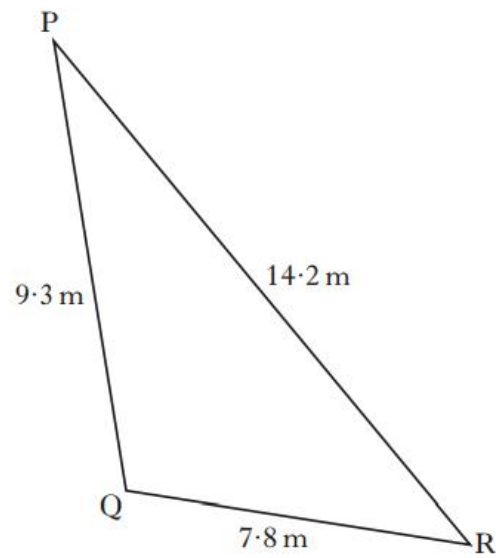The angle of depression of R from Q is 42°.
The distance PQ is 350 metres.

Calculate QS, the distance ship Q has to travel to be directly above the wreck.

Do not use a scale drawing. 5
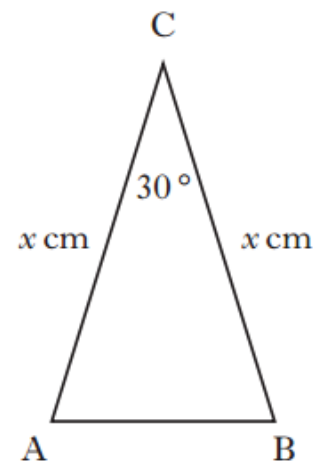
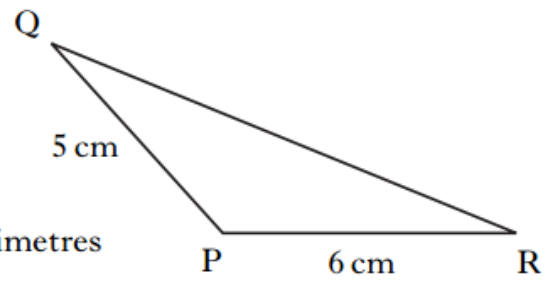Triangle PQR is shown below.

Calculate the size of angle QPR.

3

ABC is an isosceles triangle with angle $ACB = 30°$.

$AC = BC = x$ centimetres.

The area of triangle ABC is 9 square centimetres.

Calculate the value of x.

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.

Q

5 cm

P   6 cm   R