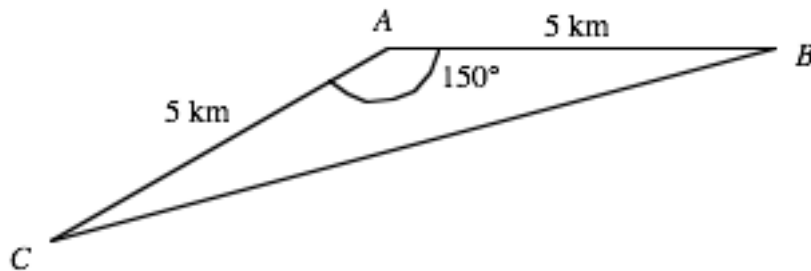
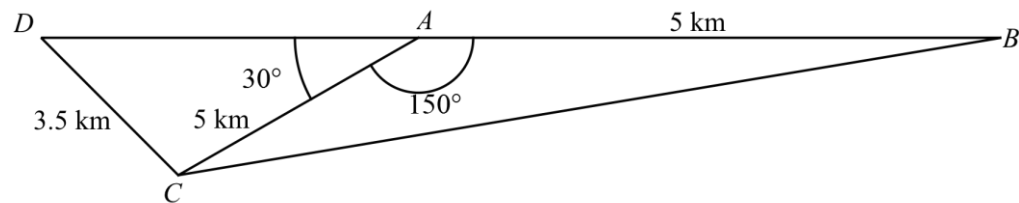


- 1 Villages B and C are each 5 km from village A , and $\angle BAC = 150^\circ$.



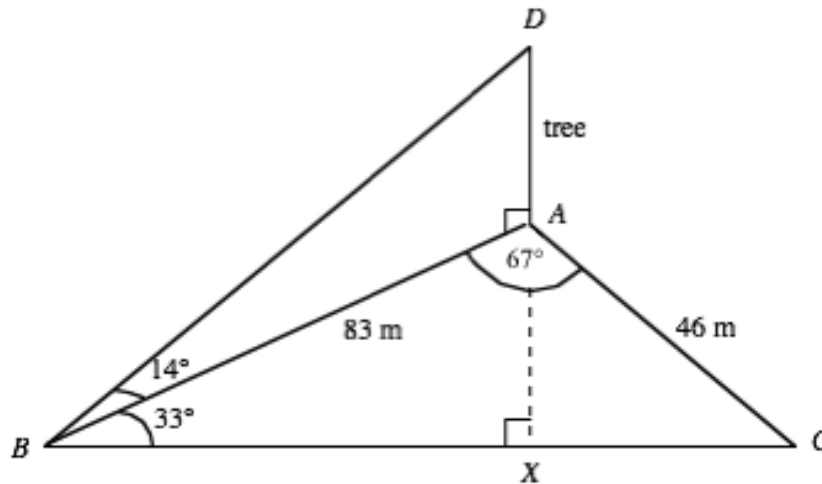
- Find the distance BC in kilometres, correct to one decimal place.
- Village D is due west of A , while village B is due east of A .



If the distance of village C from D is 3.5 km, find the size of the acute angle ADC , correct to one decimal place.

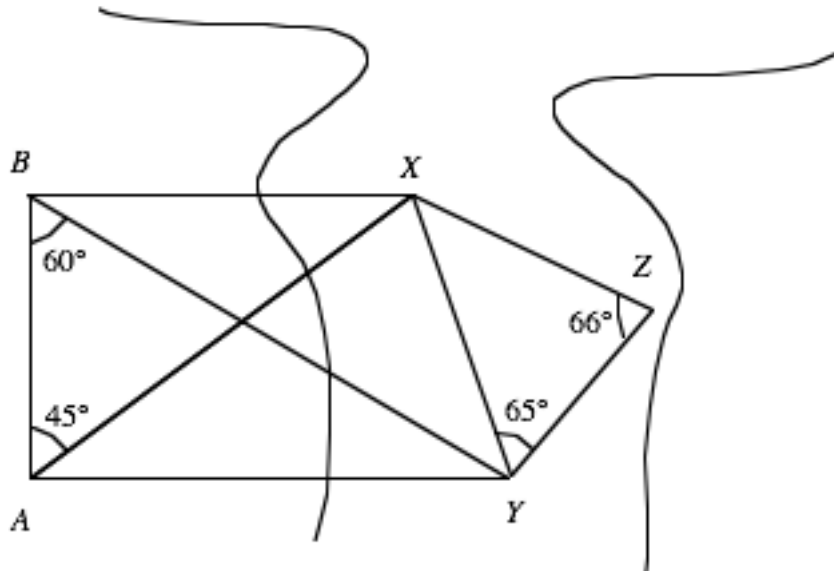
- Find the distance of village D from village A in kilometres, correct to one decimal place.
- Find the size of angle ABC .
- Find the area of triangle DBC in square kilometres, correct to one decimal place.

- 2 In the diagram, ABC represents a horizontal triangular field and AD represents a vertical tree in the corner of the field. A path runs along the edge BC of the field.



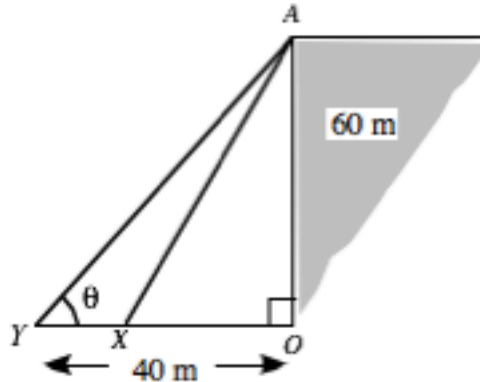
- The angle of elevation of the top of a tree when viewed from B is 14° . Calculate the height of the tree, correct to the nearest metre.
- Find the distance AX , from A to the path BC , correct to the nearest metre.
- Calculate the angle of elevation of the top of the tree when viewed from the point X on the path found in **b**.

- 3 At the entrance to a river is a sandbar, which is approximately triangular and is marked by buoys at X , Y and Z . Surveyors determine the following measurements: $BA = 1000$ m, $\angle ABX = 90^\circ$, $\angle ABY = 60^\circ$, $\angle BAY = 90^\circ$, $\angle BAX = 45^\circ$, $\angle XZY = 66^\circ$ and $\angle XYZ = 65^\circ$.

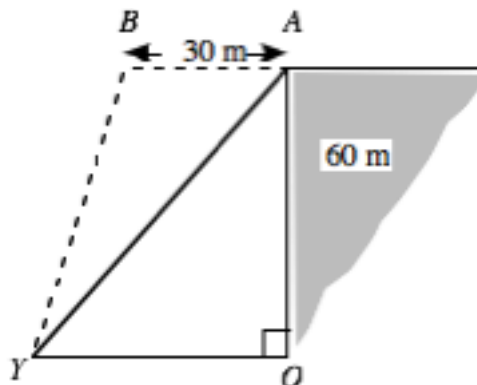


- a Find, correct to the nearest metre, the distances:
- BX
 - BY
 - XY
- b It is planned to move a layer of sand 1.1 m deep from the sandbar in order to help the flow of water out to sea. Taking the area of triangle XYZ as an approximation to the area of the sandbar, find the approximate volume of sand which has to be moved. Give your answer to the nearest thousand cubic metres.

- 4 AO is a vertical cliff face. $OA = 60$ m. A man stands at Y which is 40 m from the base of the cliff.

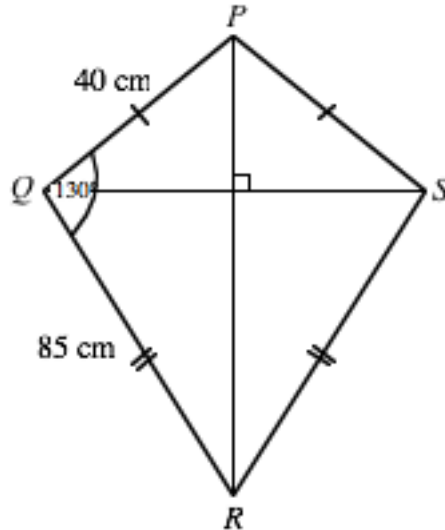


- Find the magnitude of θ , the angle of elevation of A , the top of the cliff, from Y . Give your answer to the nearest degree.
- The man walks towards the base of the cliff to a point X until the angle of elevation becomes 65° . Find the distance he has walked from Y to X , correct to the nearest metre.
- A bird flies horizontally from A to a point B , 30 m from A .



- Find the angle of elevation of B from Y . Give your answer correct to two decimal places.
 - Find the distance BY , correct to the nearest metre.
- d A kite is flown from A so that $\angle KYA = 30^\circ$, where K is the position of the kite. The length of the string of the kite, KA , is 40 m. Assume the string remains taut.
- Find AY (to the nearest cm).
 - Calculate the distance(s), to the nearest centimetre, of KY .

- e The diagram shows the kite $PQRS$. $PQ = 40$ cm, $QR = 85$ cm and the magnitude of $\angle PQR$ is 130° .



- i Find the length of PR (to the nearest mm).
- ii Find the area of the kite correct to the nearest square cm.