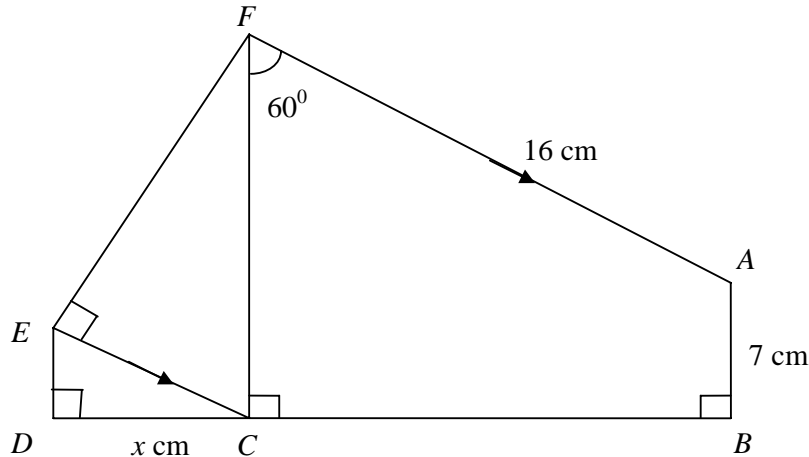
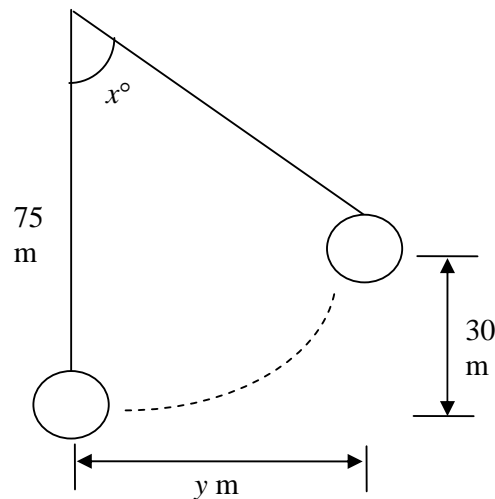


**Revision Paper 11: Trigonometry**

- Q1 In the diagram shown below,  $ABCDEF$  is a polygon.  $AF$  is parallel to  $EC$ .  $AF = 16$  cm,  $AB = 7$  cm and  $DC = x$  cm. Find
- $FC$ .
  - $FE$ .
  - $ED^2$  in terms of  $x$ .



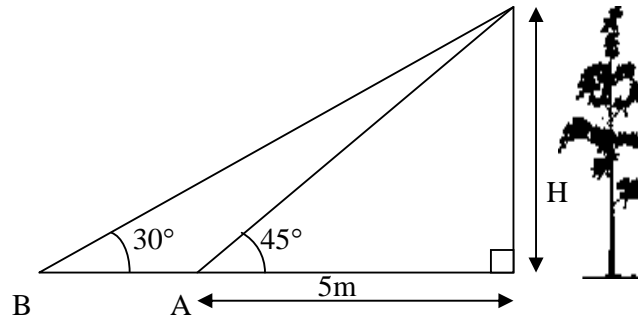
- Q2 The Singapore Flyer has a spoke length of 75 m each. Each spoke has a seating capsule attached to its end.
- What is the horizontal distance,  $y$  m, between the 2 capsules as shown in the diagram?
  - Find  $x^\circ$ , if the vertical height difference between 2 capsules is 30 m.



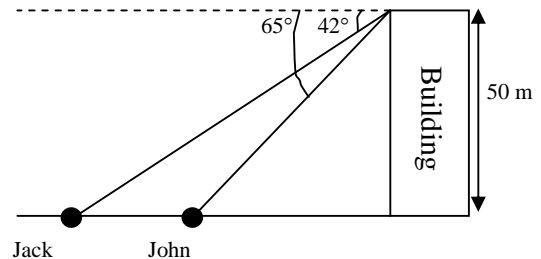
- Q3 A pagoda stands on a hill 100 m above sea level. The angle of elevation of the foot of the pagoda from a boat at sea level is  $30^\circ$  while the angle of elevation of the top of the pagoda from the same boat is  $60^\circ$ . Find the
- the distance of the boat from the foot of the hill,
  - height of the pagoda.

Q4 A boy standing 5 m away from a tree finds that the angle of elevation of the top of the tree from the point A, where he is standing, is  $45^\circ$ .

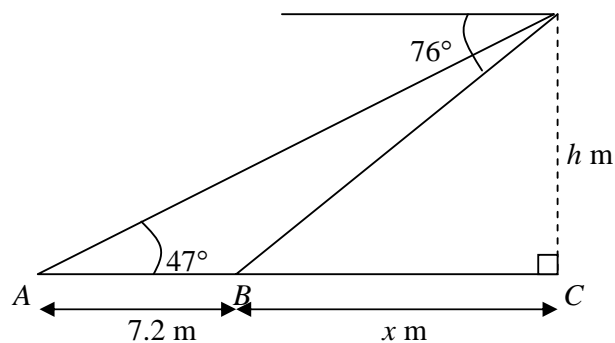
- (a) Find the height  $H$  of the tree.
- (b) If the boy walks some distance away from the tree from point A to the point B, the angle of elevation becomes  $30^\circ$ . Calculate the distance AB that he has walked.



Q5 From the top of a building 50 metres high, the angle of depression of Jack and John who are standing in front of the building is  $42^\circ$  and  $65^\circ$  respectively. How far apart are they?

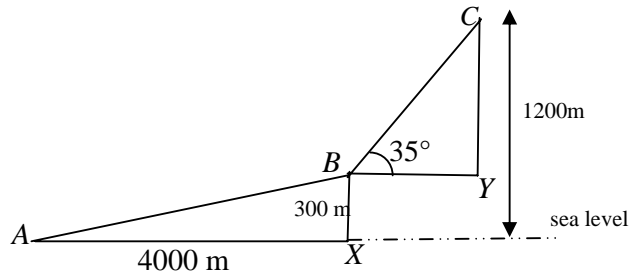


Q6 A, B and C are three points on level ground. A tree,  $h$  m tall, was planted at C. From point A, the angle of elevation of the top of the tree is  $47^\circ$ . The angle of depression of B from the top of the tree is  $76^\circ$ . It is given that B is 7.2 m nearer to the tree than A and BC is  $x$  m.



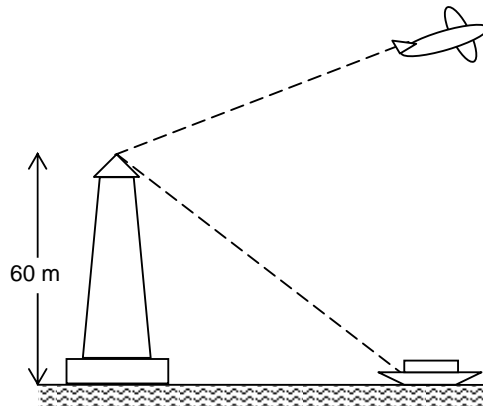
- (a) Write down two equations in terms of  $x$  and  $h$ .
- (b) Solve the equations. Hence obtain the height of the tree and the distance AC.

- Q7 A mountaineer climbed to the top of a mountain along two straight paths,  $AB$  and  $BC$ , as shown in the diagram below. He started from  $A$ , at sea level, and climbed the gentle slope to  $B$ . He then climbed the steeper section from  $B$  to the top of the mountain  $C$ .



- (a) Given that  $\angle AXB = 90^\circ$ ,  $AX = 4000$  m and that  $B$  is 300 m above sea level, calculate the actual distance he walked from  $A$  to  $B$ , giving your answer correct to the nearest 10 metres.
- (b) The point  $C$  is 1200 m above sea level. Given that  $\angle CYB = 90^\circ$  and  $\angle CBY = 35^\circ$ , calculate the distance from  $B$  to  $C$ , giving your answer to the nearest 10 metres.
- (c) Calculate the angle of depression of  $A$  from  $C$ .
- Q8 Alex climbed 20 m down a slope at an angle of depression of  $55^\circ$  and another 8 m up a slope at an angle of elevation of  $20^\circ$  without stopping. What is the height difference between his final position and his initial starting point?

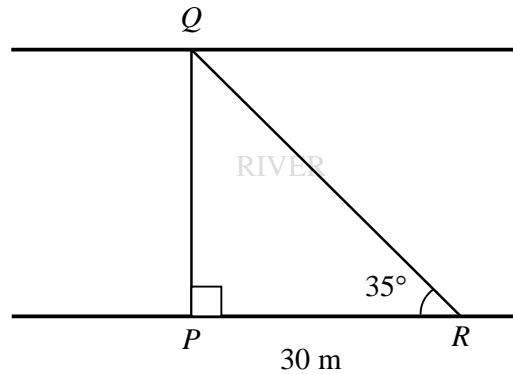
Q9



From the top of a lighthouse 60 m high, a lighthouse keeper sighted an airplane and a ship directly beneath the plane. In sighting the ship, the angle of depression was  $32^\circ$ .

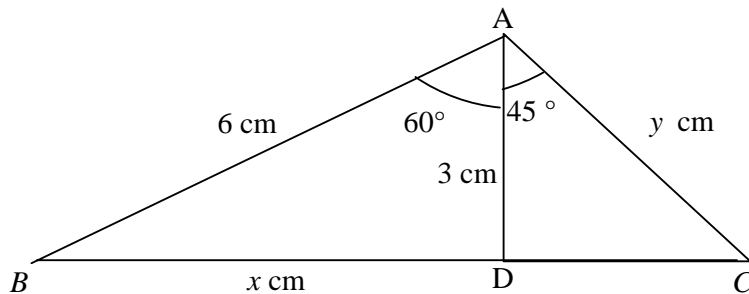
- (a) Find the distance  $d$ , of the boat from the foot of the lighthouse,
- (b) The airplane is 105 m above sea-level. Find the angle of elevation of the airplane from the top of the lighthouse.

- Q10 In order to find the width of a river, a man places a peg at a point  $P$  on the bank directly opposite a tree at  $Q$  on the opposite bank. From  $P$ , he walks 30 m along the bank of the river to a point  $R$ , and finds that  $\angle PRQ = 35^\circ$ .



- Calculate the width of the river.
- If the angle of elevation of the top of the tree from  $P$  is  $18^\circ$ , find the height of the tree.
- Find the angle of elevation of the top of the tree from  $R$ .

Q11

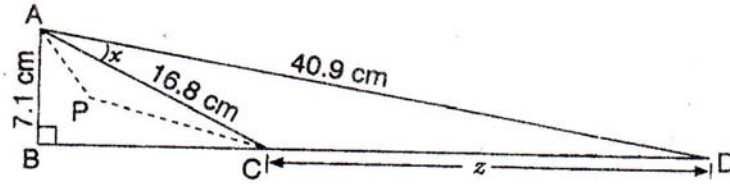


In the diagram,  $AB = 6\text{ cm}$ ,  $AD = 3\text{ cm}$ ,  $AC = y\text{ cm}$ ,  $BD = x\text{ cm}$ ,  $\angle BAD = 60^\circ$  and  $\angle CAD = 45^\circ$ .

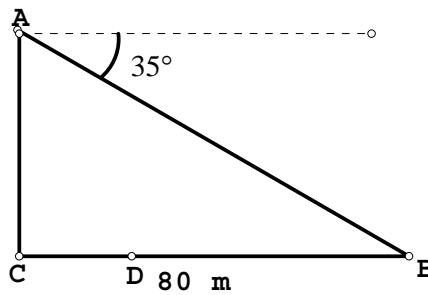
- Express  $\frac{\sin 60^\circ}{\tan 30^\circ} + (\cos 45^\circ)^2$  in terms of  $x$  and  $y$ .
- Find the values of  $x^2$  and  $y^2$ .
- Using the results in parts (a) and (b), calculate the exact numerical value of  $\frac{\sin 60^\circ}{\tan 30^\circ} + (\cos 45^\circ)^2$ .
- Find the perpendicular distance from point  $D$  to the line  $AB$ .

Q12 For the diagram shown, find

- $x$
- $z$
- The point  $P$ , inside  $\triangle ABC$ , is such that  $AP = 5\text{ cm}$  and area of  $\triangle APC = 30\text{ cm}^2$ . Find  $\angle PAC$ .



- Q13 Jill stands at A, which is at the top of a vertical cliff AC. She sees a boat on a lake at B, which is 80 m from C. The angle of depression of B from A is  $35^\circ$ .
- Find the height of the cliff.
  - A yacht is on the lake at D, where CDB is a straight line. The angle of elevation of A from D is  $55^\circ$ . Calculate the distance BD.



- Q14 Two climbers are at points A and B on a vertical cliff face. To an observer C, 30 m from the foot of the cliff on level ground, A is at an elevation of  $58^\circ$  and B of  $63^\circ$ . What is the distance between the climbers?