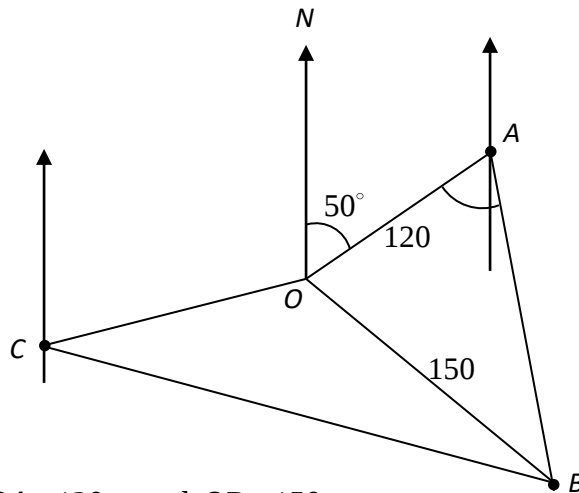


## Topical Revision Paper 12

### Term 3 Unit 12: Bearings, Sine Rule, Cosine Rule and Area of Triangle

#### Question 1:

The diagram below shows the position of three locations  $A$ ,  $B$  and  $C$  with respect to a reference point  $O$ . The bearings of  $A$ ,  $B$  and  $C$  from  $O$  are  $050^\circ$ ,  $135^\circ$  and  $240^\circ$  respectively.

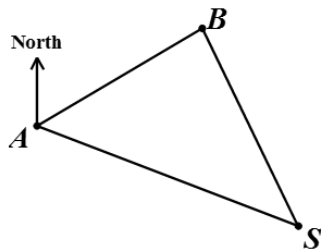


It is also given that  $OA = 120$  m and  $OB = 150$  m.

- (i) Find the bearing of  $B$  from  $A$ . [2]
- (ii) If the bearing of  $B$  from  $C$  is  $100^\circ$ , calculate the length of  $OC$ . [2]
- (iii) A mast stands vertically at  $B$  such that the angle of elevation of the top of the mast from  $O$  is  $62^\circ$ . Find the height of the mast. [2]

#### Question 2:

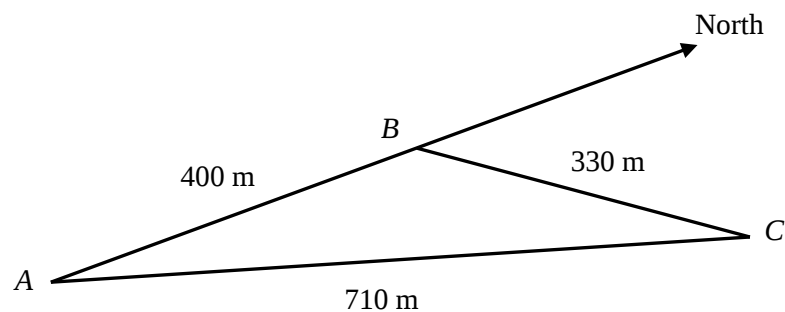
In the diagram  $A$ ,  $B$  and  $S$  represent three points in the sea.  $B$  is 3 km from  $A$  on a bearing of  $060^\circ$ . The bearings of  $S$  from  $A$  and  $B$  are  $110^\circ$  and  $155^\circ$  respectively.



- (i) Calculate the distance  $AS$ . [2]
- (ii) A ship at  $S$  sails directly to  $A$  at a steady speed of  $2 \text{ kmh}^{-1}$ . After 40 minutes, the ship is at  $T$ , a point on  $AS$ .
- (a) Calculate the distance  $BT$ . [3]
- (b) Find the bearing of  $B$  from  $T$ . [2]
- (iii) A hot air balloon,  $H$ , is lowering at a point 600 m vertically above  $B$ . Calculate the greatest angle of elevation of  $H$  from an observer on the ship as the ship sails from  $S$  to  $A$ . [2]

**Question 3:**

The diagram shows three points,  $A$ ,  $B$  and  $C$  on a piece of horizontal land. It is given that  $AB = 400 \text{ m}$ ,  $BC = 330 \text{ m}$ ,  $AC = 710 \text{ m}$  and  $B$  is due North of  $A$ .

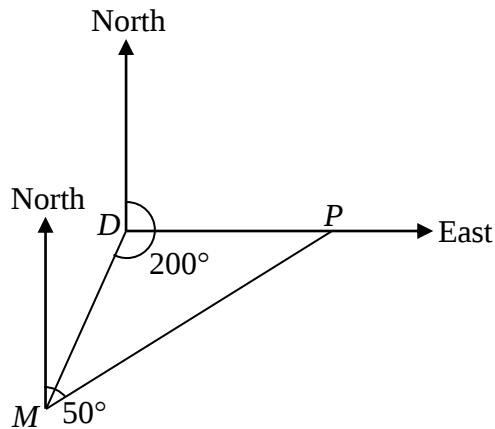


- (i) Calculate
- (a)  $\angle ABC$ , [2]
- (b) the area of triangle  $ABC$ , [2]
- (c) the bearing of  $C$  from  $A$ . [2]

- (ii)  $BZ$  is a tower crane standing vertically at  $B$  and the angle of elevation of  $Z$  from  $A$  is  $18^\circ$ . Calculate the height of the tower crane. [2]
- (iii) A car moves along the path  $AC$  until it reaches a point  $P$  which is nearest to the tower crane  $BZ$ . Calculate the largest angle of depression of the point  $P$  from  $Z$ . [2]

**Question 4:**

A man, at point  $M$ , is 80 metres at a bearing of  $200^\circ$  from an observation deck,  $D$ , which stands 25 metres tall. He begins to walk to a point  $P$  which is due East of  $D$  at a bearing of  $050^\circ$ .



Ignoring the man's height, calculate

- (i) the angle of elevation of the top of the deck from the man at  $M$ , [2]
- (ii) the distance he walks when the angle of elevation of the top of the deck from his position is the greatest, and [2]
- (iii) the distance  $DP$ . [2]