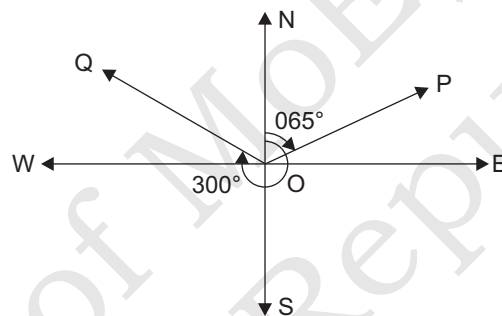




2.1. DEFINITION

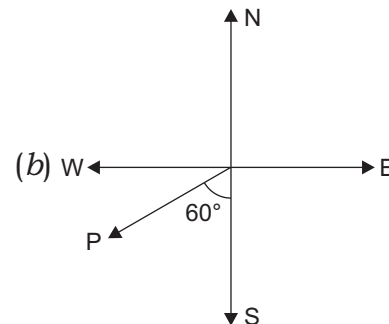
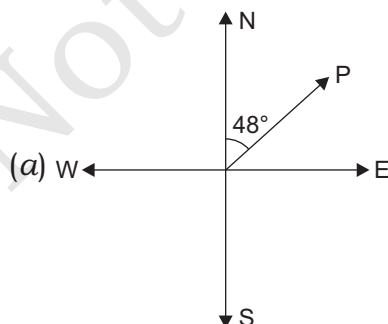
A true bearing to a point is the angle measured in degree in a clockwise direction from the north line. We will refer to the true bearing simply as the bearing.

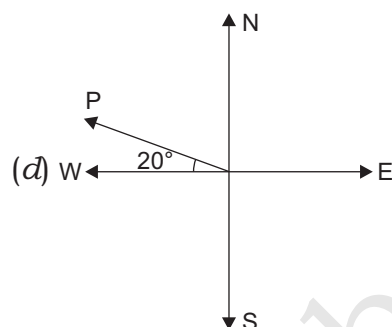
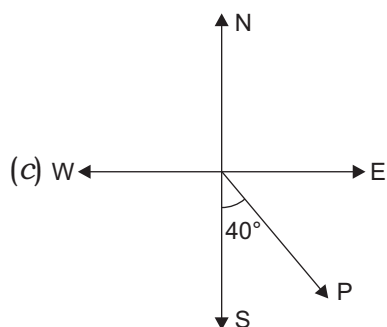


For example, the bearing of point P is 065° which is the number of degrees in the angle measured in a clockwise direction from the north line to the line joining the centre of the compass at O with the point P (*i.e.*, OP).

The bearing of point Q is 300° which is the number of degree in the angle measured in a clockwise direction from the north line to the line joining the centre of the compass at O with the point Q (*i.e.*, OQ).

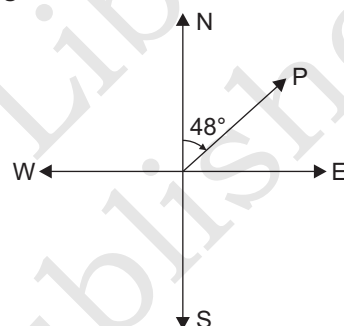
Example 1. State the bearing of the point P in each of the following diagrams:





Solution. (a) Mark the angle in a clockwise direction by indicating the turn between the north line and the line joining the centre of the compass to the point P.

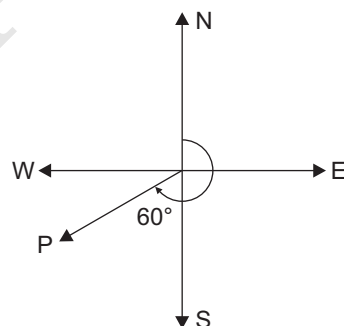
The bearing of point P is 048° .



(b) Mark the angle in a clockwise direction by indicating the turn between the north line and the line joining the centre of the compass to the point P.

The cardinal point S corresponds to 180° . It is clear from the diagram that the required angle is 60° larger than 180° . So the angle we asured in a clockwise direction from the north line joining the centre of the compass to point P is $180^\circ + 60^\circ = 240^\circ$.

So, the bearing of point P is 240° .

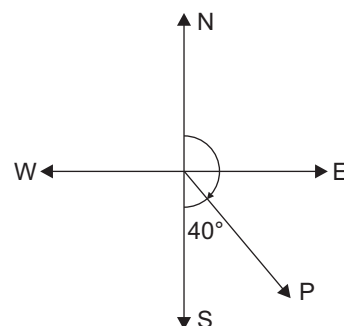


(c) Mark the angle in a clockwise direction by indicating the turn between the north line and the line joining the centre of the compass to the point P.

The cardinal point S corresponds to 180° . It is clear from the diagram that the required angle is 40° less than 180° .

So, the angle measured in a clockwise direction from the mark line to the line joining the centre of the compass to point P is $180^\circ - 40^\circ = 140^\circ$.

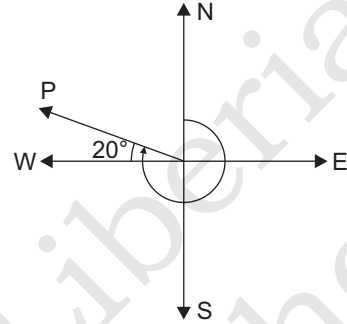
So, the bearing of point P is 140° .



(d) Mark the angle in a clockwise direction by indicating the turn between the north line and the line joining the centre of the compass to the point P.

The cardinal point *w* corresponds to 270° . It is clear from the diagram that the required angle is 20° larger than 270 . So, the angle measured in a clockwise direction from the north line to the line joining the centre of the compass to point P is $270^\circ + 20^\circ = 290^\circ$.

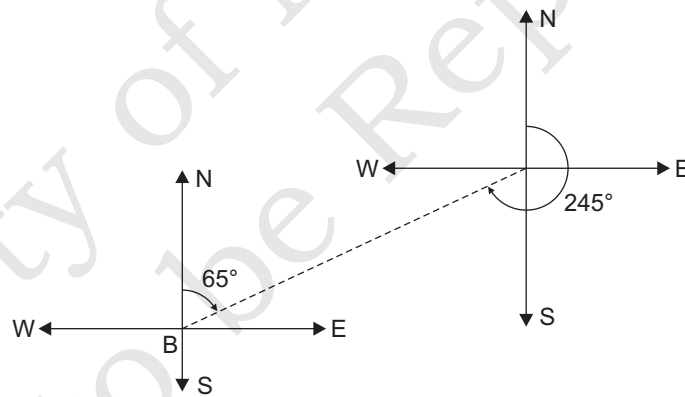
So, the bearing of point P is 290° .



Note: The bearing of a point is the number of degrees *M* the angle measured in a clockwise direction from the north line to the line joining the centre of the compass with the point.

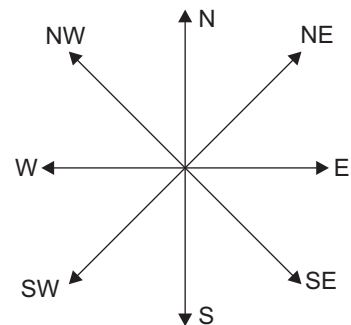
A bearing is used to represent the direction of one point relative to another point.

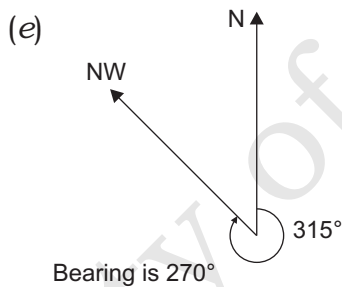
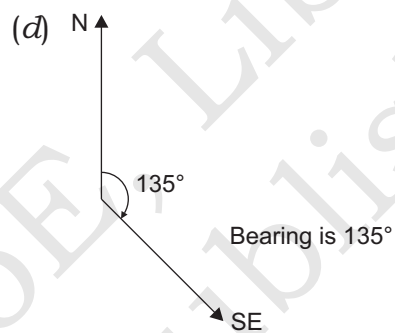
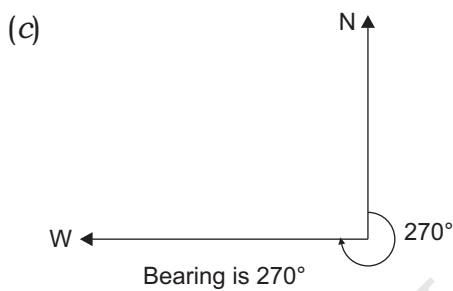
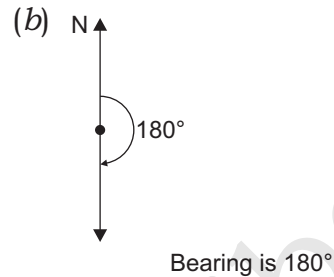
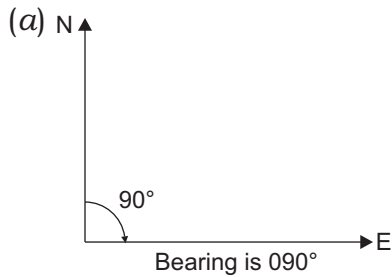
For example, the bearing of A from B is 065° . The bearing of B from A is 245° .



Example 2. On what bearings is a ship sailing if it is heading

- (a) E
- (b) S
- (c) W
- (d) SE
- (e) NW



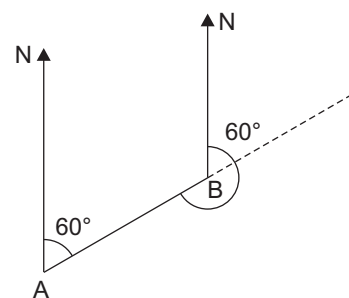
Solution.

Example 3. A ship sails from A to B on a bearing of 060° on what bearing must it sail if it is to return from B to A?

Solution. The diagram shows the journey from A to B extending the line of the journey allows an angle of 60° to be marked at B.

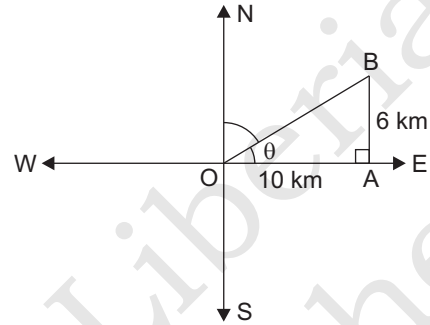
$$\begin{aligned} \text{Bearing of A from B} \\ &= 60^\circ + 180^\circ = 240^\circ \end{aligned}$$

and this is called a back bearing or a reciprocal bearing.



Example 4. A man walks 10 km east and then 6 km north. Find the bearing from the start to the finish point.

Solution. Since the distances given are in compass directions of east and north, a right-angled triangle can be drawn in which the 10 km east is the adjacent side and the 6 km north is the opposite side



$$\begin{aligned} \text{We have } \tan \theta &= \frac{AB}{OA} \\ \tan \theta &= \frac{6}{10} \\ \tan \theta &= \left(\frac{3}{5}\right) \\ \theta &\cong 31^\circ \end{aligned}$$

So, the bearing from the start to the finish point
 $= 90^\circ - 31^\circ = 59^\circ$.

EXERCISE

1. If the bearing of Y from X is 060° , find the bearing of X from Y.
2. If the bearing of P from Q is 245° , find the bearing of Q from P.
3. If the bearing of a point Q from another point P is 040° , find the bearing of P from Q.