

USE OF BEARINGS IN SURVEYING

Types of bearings

- true bearings
- magnetic bearings
- compass bearings

The true bearing to a point is the angle measured in degrees in a clockwise direction from the north line. These are relative to True North and are taken off the compass rose (See Figure 1)

The four main directions of a compass are north (N), east (E), south (S) and west (W). Sometimes, the half-cardinal points of north-east (NE), north-west (NW), south-east (SE) and south-west (SW) are shown on the compass. The compass below shows degree measurements from 0° to 360° in 2° intervals with:

- north representing 0° or 360°
- east representing 90°
- south representing 180°
- west representing 270°

A *magnetic bearing* is measured in relation to magnetic north, that is, using the direction toward the magnetic north pole .

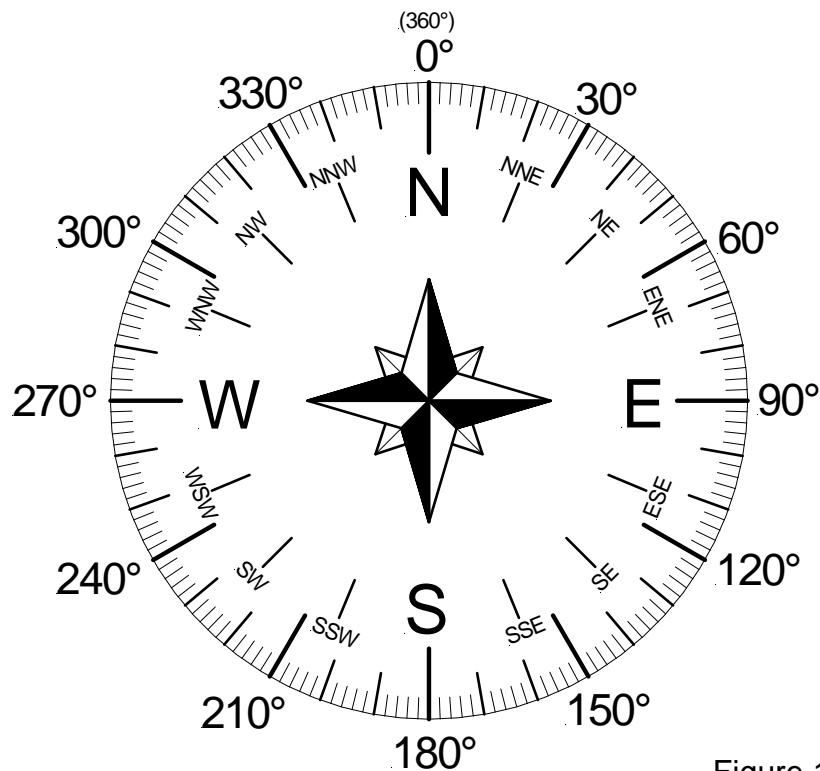


Figure 1

How to convert from True to Magnetic

1. Read the variation from the compass rose on the chart, adjusting if necessary to the current year
2. If the variation is WEST, add it to the true reading If the variation is EAST, subtract it from the true reading

For example, the true direction is 278 degrees and the variation is 6 degrees WEST, then the magnetic reading is 272 degrees. In Surveying we use only the true or compass bearing.

Bearing measurement

There are several methods used to measure navigation bearings:

- **Bearing**
- **Direction**

Bearing

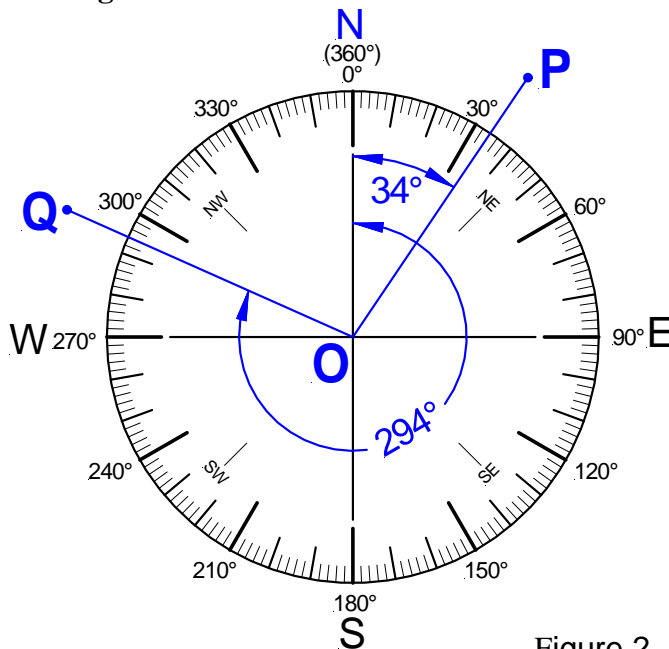


Figure 2

The bearing of a point 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 with the point.

For example, the bearing of point *P* is 034° 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*).

Another example, the bearing of point *Q* is 294° 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 *Q* (i.e. *OQ*).

Direction

Whereas the bearings refer to degrees as shown in Figure 2 directions refer to north, south, east and west.

On the other hand the **conventional bearing** of a point is stated as the number of degrees east or west of the north-south line. will refer to the conventional bearing simply as the **direction**.

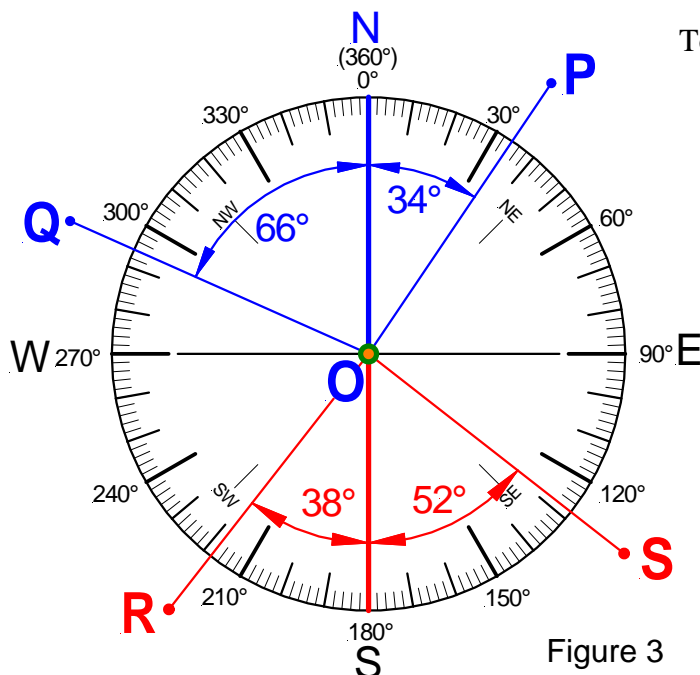


Figure 3

To state the **direction** of a point, write:

- N or S which is determined by the angle being measured
- the angle between the north or south line and the point, measured in degrees
- E or W which is determined by the location of the point relative to the north-south line

Example - Figure 3, the direction of:

P from O is N34°E.

Q from O is N66°W.

S from O is S52°E.

R from O is S38°W.

The website below defines all Cardinal points of the compass rose

<http://www.geog.port.ac.uk/webmap/hantsmap/hantsmap/cmprose.htm>