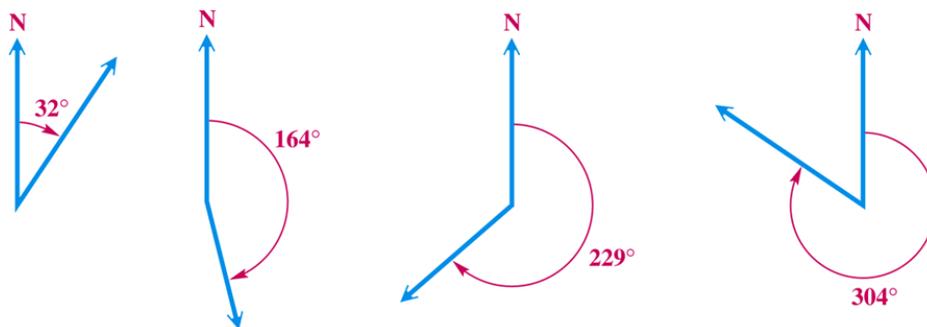


Section 2.5: Further Applications of Right Triangles

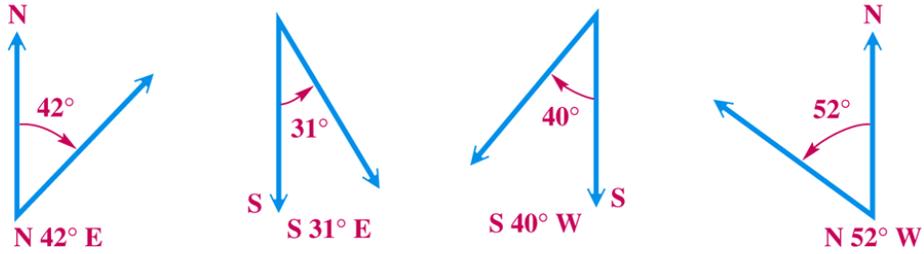
I. Bearing

- There are two methods for expressing **bearing**.
- **First Method:** When a single angle is given, such as 164° , it is understood that the bearing is measured in a clockwise direction from due north.

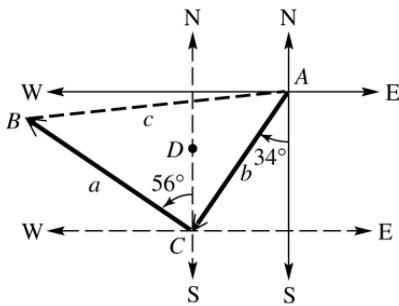


Example 1 (Solving Problem Involving Bearing): Radar stations A and B are on an east-west line, 8.6 km apart. Station A detects a plane at C , on a bearing of 53° . Station B simultaneously detects the same plane, on a bearing of 323° . Find the distance from B to C .

- Second Method:** The second method for expressing bearing starts with a north-south line and uses an acute angle to show the direction, either east or west, from this line.

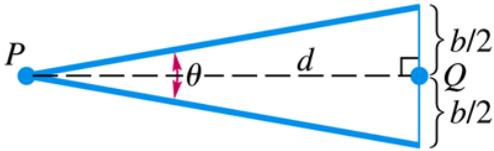


Example 2 (Solving Problem Involving Bearing): A ship leave port and sails on a bearing of $S\ 34^\circ\ W$ for 2.5 hr. It then turns and sails on a bearing of $N\ 56^\circ\ W$ for 3 hr. If the ships rate of speed is 18 knots (nautical miles per hour), find the distance that the ship is from port. The port is at A.



II. Further Applications

Example 3 (Using Trigonometry to Measure a Distance): The **subtense bar method** is a method that surveyors use to determine a small distance d between two points P and Q . The subtense bar with length b is centered at Q and situated perpendicular to the line of sight between P and Q . Angle θ is measured, then the distance d can be determined.



- a) Find d with $\theta = 2^\circ 41' 38''$ and $b = 3.5000$ cm.

- b) Angle θ usually cannot be measured more accurately than to the nearest $1''$. How much change would there be in the value of d if θ were measured $1''$ larger?

Practice: Marla needs to find the height of a building. From a given point on the ground, she finds that the angle of elevation to the top of the building is 74.2° . She then walks back 35 feet. From the second point, the angle of elevation to the top of the building is 51.8° . Find the height of the building.

