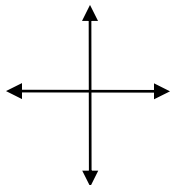


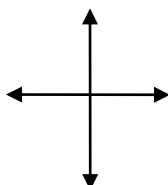
In surveying and navigation, directions are often given in terms of *bearings*. A bearing measures the acute angle that a path or line of sight makes with a fixed north-south line. For example, N 25° W is the bearing that means 25 degrees west of north.

Example 1: Sketch the given bearings.

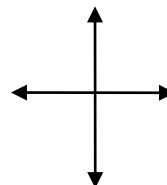
a. N 25° W



b. S 60° E



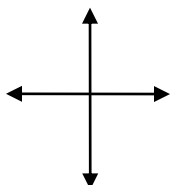
c. N 80° E



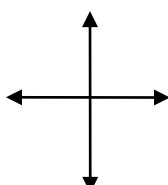
In air navigation, *bearings* are measured in clockwise degrees from north.

Example 2: Sketch the following air navigational bearings.

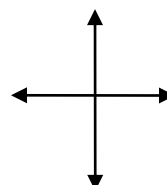
a. 45°



b. 120°



c. 225°



Example 3: A jet leaves Detroit, Michigan and is headed toward Miami, Florida at a bearing of 155° . The distance between the two cities is approximately 1152 miles.

a. How far north and how far west is Detroit relative to Miami?

b. If the jet returns directly to Detroit from Miami, then what bearing should it travel?



Example 4: A sailboat leaves a pier and heads due west at 8 knots, or 8 nautical miles per hour. After 15 minutes the sailboat tacks, changing course, to $N 16^\circ W$ at 10 knots. Find the sailboat's bearing and distance from the pier after 12 minutes on this course.