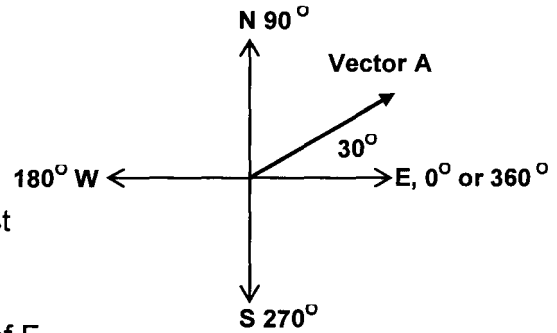


### DIRECTION OF VECTORS

**VECTORS** are measurements that have size and direction. Vector directions may be given in polar coordinates, as degrees counterclockwise from East or X+ axis or map coordinates given by an angle measured from the horizontal X axis. What gets a bit confusing is that that horizontal direction could be EAST or WEST. And the angle could be above the horizontal (NORTH) or below the horizontal (SOUTH). Therefore, a precise map vector direction must include 3 parts:

- 1) an angle measurement (in degrees)
- 2) a N/S direction
- 3) an E/W direction.



For example, the VECTOR A is  $30^\circ$  above the east

In polar coordinates this is simply  $30^\circ$

In map coordinates say it has the direction  $30^\circ$  N of E

You geometry whizzes may also recognize that vector A makes a  $60^\circ$  ( $90^\circ - 30^\circ$ ) angle with the North. Some call this  $60^\circ$  E of N, which is technically correct, but WE WILL ALWAYS measure the angle from the horizontal

Vector A also makes a  $150^\circ$  angle with the west ( $180^\circ - 30^\circ = 150^\circ$ ). True, you could call this vector  $150^\circ$  N of W, but we will always give angles of less than  $90^\circ$ !

