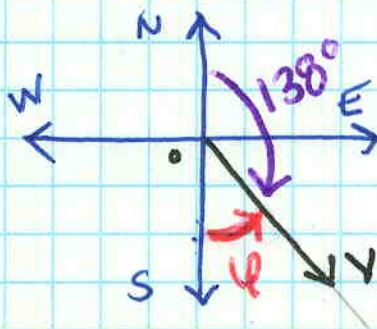


## 8-1-2 Vectors - Geometrically

### Alternate Vector Measures

### Bearing (Navigational)

Quadrant Bearing  $\rightarrow \varphi$  (phi)  $\rightarrow$  directional measurement between  $0^\circ - 90^\circ$  measured from N/S to E/W.



$$\varphi = \dots \underline{\underline{S 42^\circ E}}$$

True Bearing =  $138^\circ$

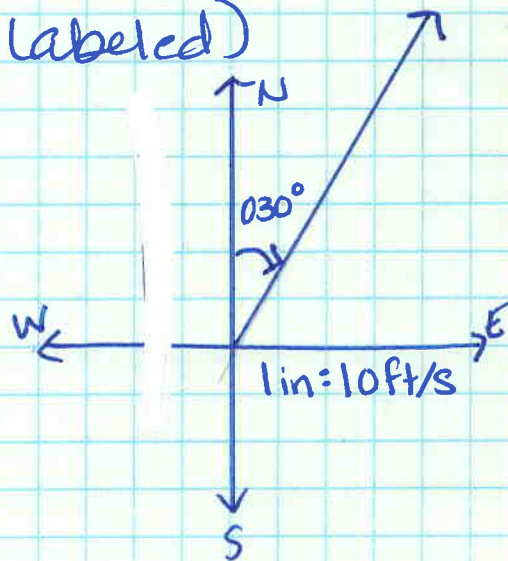
True Bearing  $\rightarrow$  angle measures Clockwise from North. ( $360^\circ$  system)

Always given in 3 digits  $25^\circ$  from N =  $025^\circ$   
when no directional components given,  
use true bearing.

### Example 2. Drawing a Vector

Ruler, Protractor, Scale (labeled)

a)  $a = 20 \text{ ft/s}$  at  $030^\circ$   
Scale  $1 \text{ in} = 10 \text{ ft/s}$



# Drawing Vectors

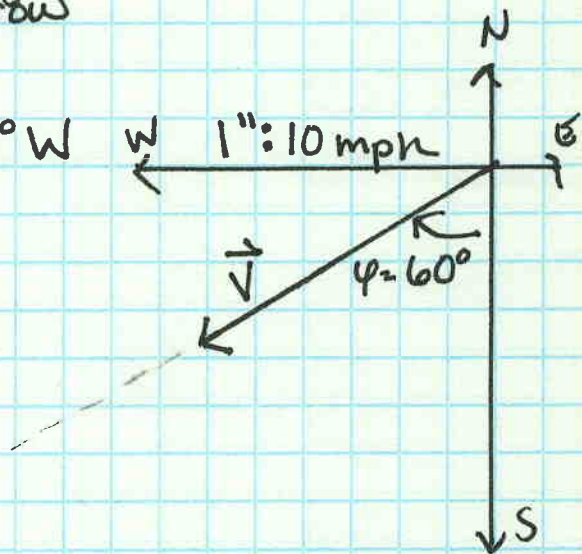
- ① Precision  
- Protractor/Ruler
- ② Scale (on figure)
- ③ Axis
- ④ Labels
- ⑤ Angle
- ⑥ Arrow

Ex 2.  $\vec{v}$  45mph at  $S60^\circ W$

Scale:

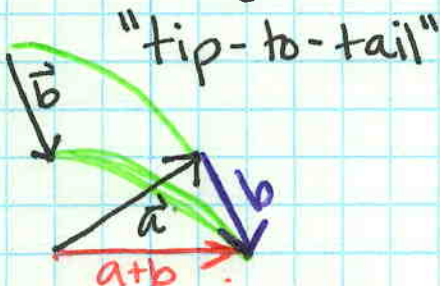
1cm : 10mph  
 $\vec{v}$  4.5 cm long

1in : 20mph  
 $\vec{v}$  = 2.25in



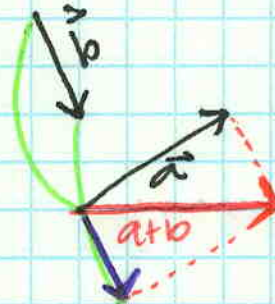
## Adding Vectors

### Triangle Method



- ① translate tail of  $\vec{b}$  to tip of  $\vec{a}$
- ② initial point of  $\vec{a}$  to terminal point of  $\vec{b}$
- ③ New coord. system

### Parallogram Method



- ① Translate tail of  $\vec{b}$  to tail of  $\vec{a}$
- ② complete parallelog.
- ③ Resultant vector  
diag. from tails.



#4. Add 4 in/min  $135^\circ$   
4 in/min  ~~$135^\circ$~~   
300°  
lin: 2 in/min

