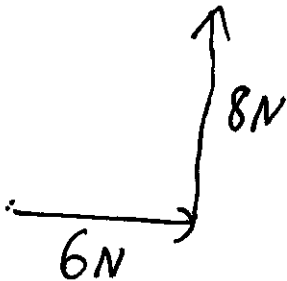


For problems 7-10,

Write the vector in terms of
magnitude and direction.

⑦



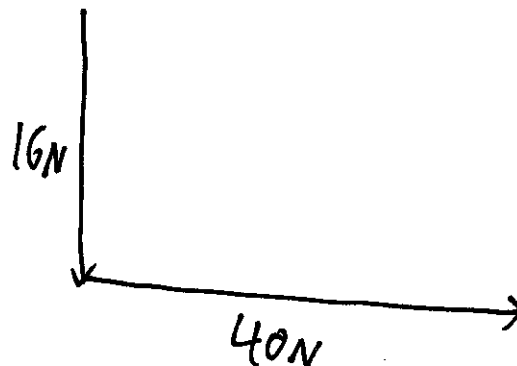
⑧



⑨



⑩

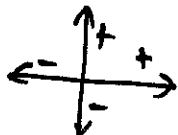


Vector Form conversions ^(A)

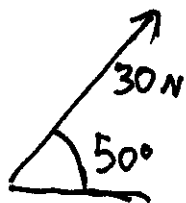
For problems 1-6,

Determine the components of each vector.

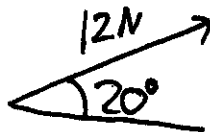
Use the following sign convention:



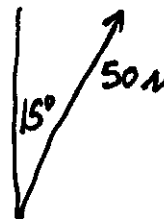
①



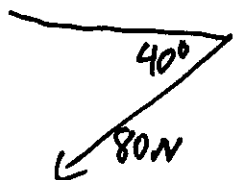
②



③



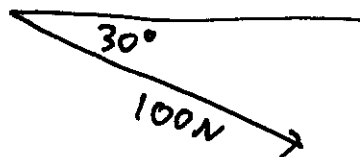
④



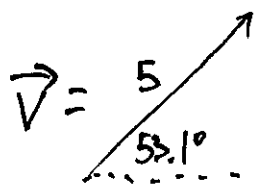
⑤



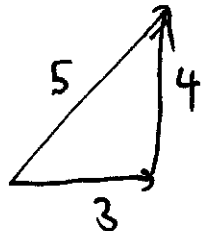
⑥



Notation of component form:



\Rightarrow



This vector \vec{V} has a x-component of +3 and a y-component of +4.

How do you write this? There are several options:

- Angle brackets: $\vec{V} = \langle +3, +4 \rangle$
- Matrix notation: $\vec{V} = [3, 4]$ or $\begin{bmatrix} 3 \\ 4 \end{bmatrix}$
- Unit vector notation: $\vec{V} = 3\hat{i} + 4\hat{j}$

The x-component appears in front of \hat{i}
and the y-component appears in front of \hat{j} .

- Ordered-pair notation $\vec{V} = (3, 4)$
- Javascript Object Notation $\vec{V} = \{ "x": 3, "y": 4 \}$

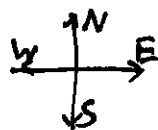
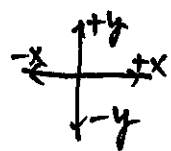
Of these, in physics, the most commonly used is unit vector notation.

Therefore, ~~the~~ write your answer that way

$$\boxed{\vec{V} = 3\hat{i} + 4\hat{j}}$$

Notation for Magnitude-Direction form of a vector!

- If the vector ~~is~~ ~~lines~~ lines up with an axis ~~or~~ or compass direction, ~~write~~ then write it:

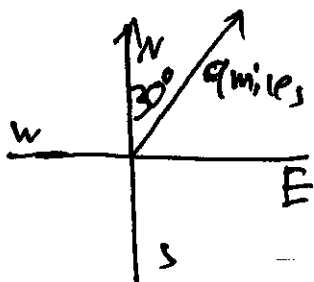


$$\underline{5 \text{ mi}} \rightarrow = 5 \text{ miles east}$$

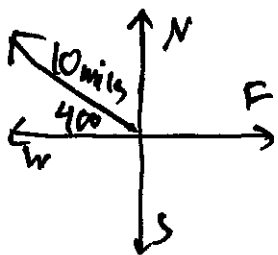
$$\uparrow 6 = 6 \text{ in the } +y \text{ direction}$$

$$\leftarrow 8 = 8 \text{ in the } -x \text{ direction}$$

- If not, we use the following terminology!



$$= 9 \text{ miles at } 30^\circ \text{ east of north}$$

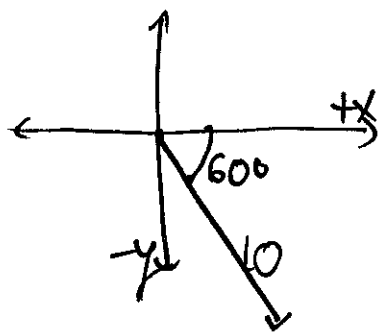


$$= 10 \text{ miles at } 40^\circ \text{ north of west}$$

Note that ~~at~~ ~~angles~~

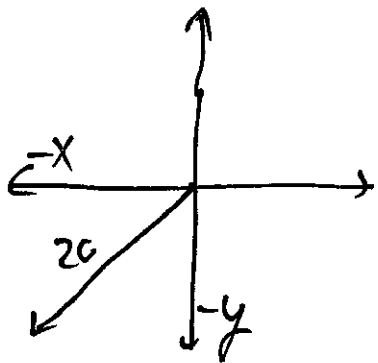
$$9 \text{ miles at } 30^\circ \text{ east of north} = 9 \text{ miles at } 60^\circ \text{ north of east}$$

$$10 \text{ miles at } 40^\circ \text{ north of west} = 10 \text{ miles at } 50^\circ \text{ west of north}$$



$= 10$ at 60° down from $+x$ axis

$= 10$ at 30° right of $-y$ axis



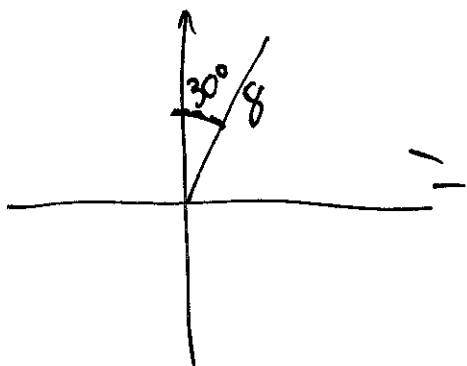
$= 20$ at 45° ~~so~~ down from $-x$ axis

$= 20$ at 45° left of $-y$ axis

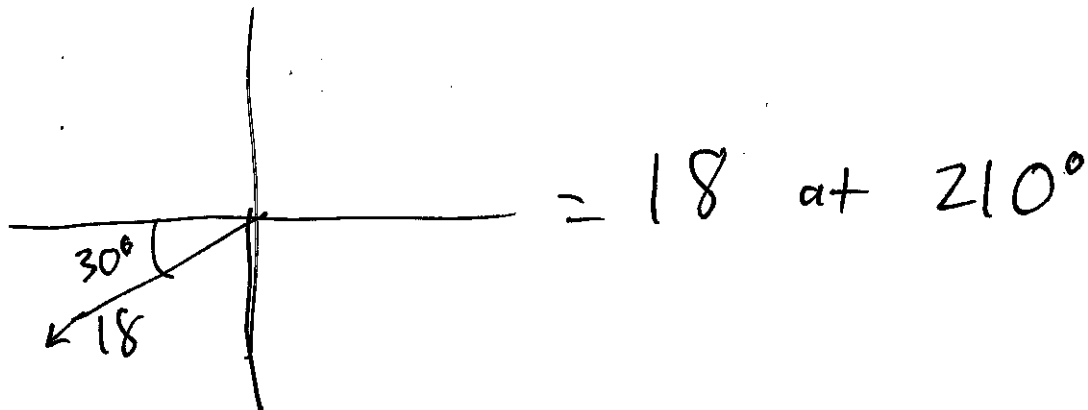
Polar coordinate form:

In polar coordinate form, you give the magnitude and give the direction as a angle from 0 to 360° , in which 0 is the $+x$ axis and you proceed clockwise

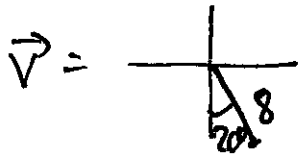
[as in the unit circle in math class.]



$= 8$ at 60°



Notation for polar coordinates:



- writing it $\vec{V} = 8 \text{ at } 290^\circ$
- ordered pair form $\vec{V} = (8, 290^\circ)$
- Explicitly writing ~~equation~~ values:
 $\vec{V} : r = 8 \quad \theta = 290^\circ$
- Javascript object notation:

$$\vec{V} = \{ "r": 8, \\ "theta": 290 \}$$