COMPONENT FORM

Find the component form of the vector v with the given magnitude and angle.

A) $v=|10|$ $\theta=35°$
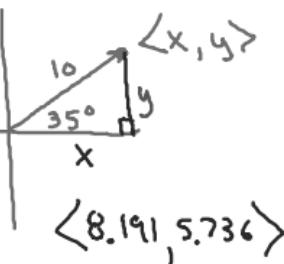
$V=|10|$ $\theta=35°$

$(10)\cos 35° = \dfrac{x}{10}(10)$

$\underline{10\cos 35° = x}$

$\sin 35° = \dfrac{y}{10}$

$10\sin 35 = y$

$\langle x,y\rangle$

$\langle 8.191, 5.736\rangle$

B) $v=|20|$ $\theta=135°$

(B) $\boxed{V=|20| \quad \theta=135°}$

$x=20\cos 135°$ $\quad$ ~~$x=20\cos 45°$~~

$y=20\sin 135°$ $\quad$ ~~$y=20\sin 45°$~~

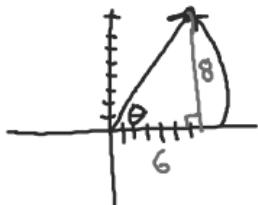$\boxed{\begin{array}{l} x=|v|\cos\theta \\ y=|v|\sin\theta \end{array}}$

Find Magnitude and Direction Angle

Find the magnitude and direction angle of the vector.

A) $\langle 6,8\rangle = u$

$\langle 6,8\rangle = u$

$|u| = \sqrt{6^2+8^2} = 10$

$\tan\theta = \dfrac{8}{6}$

$\boxed{\theta = \tan^{-1}\left(\dfrac{8}{6}\right)}$

$\theta = 53.13°$

B) $6i-8j$ $\quad\boxed{360 - 53.13}$

Direction Angle

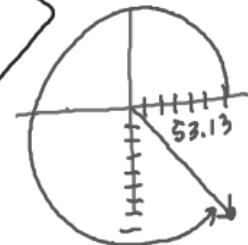$\boxed{\theta = \tan^{-1}\left(\dfrac{y}{x}\right)}$

(B) $\boxed{6i-8j}$

$6\langle 1,0\rangle - 8\langle 0,1\rangle$

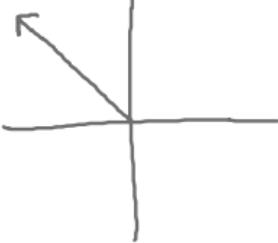$\langle 6,0\rangle - \langle 0,8\rangle$

$\boxed{\langle 6,-8\rangle}$

$\theta = \tan^{-1}\left(\dfrac{-8}{6}\right)$

$\theta = -53.13°$

53.13

C) $10(\cos 235° i + \sin 235° j)$

$10(\cos 235 i + \sin 235 j)$

$10\langle \cos 235, \sin 235\rangle$

$10\langle -.574, -.819\rangle$

$\langle -5.74, -8.19\rangle$

$\boxed{\theta = 235°}$

$mag = \sqrt{(-5.74)^2 + (-8.19)^2}$

$mag = \sqrt{(10\cos 235)^2 + (10\sin 235)^2}$

Navigation

A) An airplane is flying on a bearing of 135° at 435 mph. Find the component form of the velocity of the airplane.

Direction angle

Magnitude = Speed = Velocity

$x = 435 \cos 135$

$y = 435 \sin 135$

B) An airplane is flying on a compass heading(bearing) of 315° at 300 mph. A wind is blowing with the bearing 220° at 30 mph.
- Find the component form of the velocity of the airpane.

- Find the component form of the velocity of the wind.

- Find the actual ground speed and direction of the airplane