


The component form of vector \vec{v} is given. Find the magnitude and direction of \vec{v}

1. $\vec{v} = \langle \sqrt{3}, 1 \rangle$


$$\|\vec{v}\| = \sqrt{3+1}$$


$$= \sqrt{4}$$

$$\theta' = \tan^{-1}\left(\frac{1}{\sqrt{3}}\right)$$

$$\theta' = 30^\circ$$

$$\|\vec{v}\| = 2$$

$$\theta = 30^\circ$$

2. $\vec{v} = \langle -8, 8 \rangle$


$$\|\vec{v}\| = \sqrt{64+64}$$

$$= 8\sqrt{2}$$


$$\theta' = \tan^{-1}(-1)$$

$$\theta' = 45^\circ$$

$$\theta = 180^\circ - 45^\circ$$

$$\|\vec{v}\| = 8\sqrt{2}$$

$$\theta = 135^\circ$$

3. $\vec{v} = \langle \sqrt{2}, -\sqrt{6} \rangle$


$$\|\vec{v}\| = \sqrt{2+6}$$

$$= \sqrt{8} = 2\sqrt{2}$$


$$\theta' = \tan^{-1}\left(\frac{-\sqrt{6}}{\sqrt{2}}\right)$$

$$\theta' = \tan^{-1}(-\sqrt{3}) = 60^\circ$$

$$\theta = 360^\circ - 60^\circ$$

$$\|\vec{v}\| = 2\sqrt{2}$$

$$\theta = 300^\circ$$

4. $\vec{v} = \langle -4, -5 \rangle$


$$\|\vec{v}\| = \sqrt{16+25}$$

$$= \sqrt{41}$$


$$\theta' = \tan^{-1}\left(\frac{-5}{-4}\right)$$

$$\theta' = 51.34^\circ$$

$$\theta = 180^\circ + 51.34^\circ$$

$$\|\vec{v}\| = \sqrt{41}$$

$$\theta = 231.34^\circ$$

5. $\vec{v} = \langle -2, 3 \rangle$


$$\|\vec{v}\| = \sqrt{4+9}$$

$$= \sqrt{13}$$

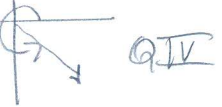
$$\theta' = \tan^{-1}\left(-\frac{3}{2}\right)$$

$$\theta' = 56.31^\circ$$

$$\theta = 180^\circ - 56.31^\circ$$

$$\|\vec{v}\| = \sqrt{13}$$

$$\theta = 123.69^\circ$$

6. $\vec{v} = \langle 6, -7 \rangle$


$$\|\vec{v}\| = \sqrt{36+49}$$

$$= \sqrt{85}$$

$$\theta' = \tan^{-1}\left(-\frac{7}{6}\right)$$

$$\theta' = 49.40^\circ$$

$$\theta = 360^\circ - 49.40^\circ$$

$$\|\vec{v}\| = \sqrt{85}$$

$$\theta = 310.60^\circ$$

answers:

1) $\|\vec{v}\| = 2; \theta = 30^\circ$

2) $\|\vec{v}\| = 8\sqrt{2}; \theta = 135^\circ$

3) $\|\vec{v}\| = 2\sqrt{2}; \theta = 300^\circ$

4) $\|\vec{v}\| = \sqrt{41}; \theta = 231.34^\circ$

5) $\|\vec{v}\| = \sqrt{13}; \theta = 123.7^\circ$

6) $\|\vec{v}\| = \sqrt{85}; \theta = 310.6^\circ$