

Find the magnitude and direction angle of each vector.

1. $v = 5\cos 30^\circ i + 5\sin 30^\circ j$

$\|v\| = 5$

$\theta = 30^\circ$

2. $v = \left\langle 8\cos \frac{3\pi}{4}, 8\sin \frac{3\pi}{4} \right\rangle$

$\|v\| = 8$

$\theta = \frac{3\pi}{4}$

3. $v = \langle 3, 3 \rangle$

$\|v\| = 3\sqrt{2}$

$\theta = \frac{\pi}{4}$ or 45°

4. $v = \langle 0, 4 \rangle$

$\|v\| = 4$

$\theta = \frac{\pi}{2}$ or 90°

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

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

$\theta = -56^\circ$ or 304°

Find the linear form of v given its magnitude and direction angle. Sketch v .

Magnitude

6. $\|v\| = 3$

Angle

$\theta = 0^\circ$

$3i + 0j$



7. $\|v\| = 1$

$\theta = 150^\circ$

$\frac{5\pi}{6}$

$\frac{\sqrt{3}}{2}i + \frac{1}{2}j$



8. $\|v\| = 3\sqrt{2}$

$\theta = 60^\circ$

$\frac{3\sqrt{2}}{2}i + \frac{3\sqrt{6}}{2}j$



9. $\|v\| = 2$

v in the same direction as $i + 3j$

unit vector $\rightarrow \frac{1}{\sqrt{10}}i + \frac{3}{\sqrt{10}}j$

mag = 2 $\rightarrow \frac{2}{\sqrt{10}}i + \frac{6}{\sqrt{10}}j$

$\frac{\sqrt{10}}{5}i + \frac{3\sqrt{10}}{5}j$

$\tan \theta = \frac{3}{1}$
 $\theta = 72^\circ$

$0.62i + 1.9j$

10. $\|v\| = 3$

v in the same direction as $3i + 4j$

unit vector $\rightarrow \frac{3}{5}i + \frac{4}{5}j$

mag = 3 $\rightarrow \frac{9}{5}i + \frac{12}{5}j$

$\tan \theta = \frac{4}{3}$

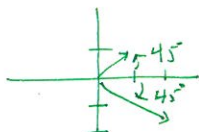
$\theta = 53^\circ$

$1.8i + 2.4j$



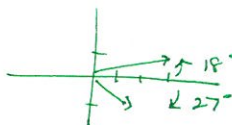
Find the angle between the given vectors.

11. $v = i + j$ $w = 2(i - j)$



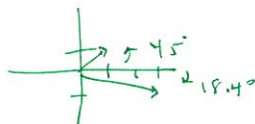
90°

12. $v = 3i + j$ $w = 2i - j$



45°

13. $v = i + j$ $w = 3i - j$



63°