9.1: (Vectors in Two Dimensions)

If the vector u has magnitude 8, direction angle 120° and the vector $v = \sqrt{3}i + 4j$, then the vector $u - \sqrt{3}v =$

a) $\langle -7,\ 0 \rangle$

b) $\langle 2, -1 \rangle$

c) $\langle 7,\ 8\sqrt{3} \rangle$

d) $\langle -7,\ -8\sqrt{3} \rangle$

e) $\langle -3 + 4\sqrt{3},\ -4 + 4\sqrt{3} \rangle$

Let $\mathrm{u} = \mathrm{i}$ and $\mathrm{v} = 2\sqrt{3}\mathrm{i} - 4\mathrm{j}$ be two vectors. If θ is the direction angle of the vector $2\mathrm{u} - \sqrt{3}\mathrm{v}$, then $\sin\theta =$

A) $\frac{\sqrt{3}}{2}$

B) $-\frac{\sqrt{3}}{2}$

C) $\frac{1}{2}$

D) $-\frac{1}{2}$

E) $-\frac{\sqrt{2}}{2}$

If u is a vector of magnitude $8\sqrt{2}$ and direction 135° and $\mathrm{v} = 3\mathrm{i} - 2\mathrm{j}$ then the vertical component of the vector $\mathrm{w} = \mathrm{u} + 2\mathrm{v}$, is

A) 4

B) -4

C) -2

D) 6

E) 2

If the vector u has magnitude 8 and directional angle π, and vector $\mathrm{v} = 4\mathrm{i} + 4\sqrt{3}\mathrm{j}$, then the directional angle α of the vector $\mathrm{u} + \mathrm{v}$ is

A) $\alpha = \frac{2\pi}{3}$

B) $\alpha = \frac{11\pi}{6}$

C) $\alpha = \frac{4\pi}{3}$

D) $\alpha = \frac{5\pi}{6}$

E) $\alpha = \frac{5\pi}{3}$

Given the vectors $u = \langle 9,\ 24\rangle$, and $v = 10i + 12j$. If $w = \frac{1}{2}u - \frac{3}{4}v$, then the direction angle of the vector w is

a) $\frac{3\pi}{4}$

b) $\frac{7\pi}{4}$

c) $\frac{5\pi}{4}$

d) $\frac{11\pi}{6}$

e) $\frac{5\pi}{3}$

If $u = \langle 1,0\rangle$ and $v = \langle 2\sqrt{3}, -4\rangle$, then the magnitude r and the direction angle θ of the vector $2u - \sqrt{3}v$ are

a) $r = 8, \theta = 120^\circ$

b) $r = 8, \theta = 150^\circ$

c) $r = 16, \theta = 210^\circ$

d) $r = 4, \theta = 300^\circ$

e) $r = 4, \theta = 330^\circ$

If $\mathrm{u} = \langle -2\sqrt{3}, 4\rangle$ and $\mathrm{v} = \sqrt{3}\mathrm{i} + \mathrm{j}$, then the direction angle of the vector $\mathrm{u} - \mathrm{v}$ is

A) $150°$

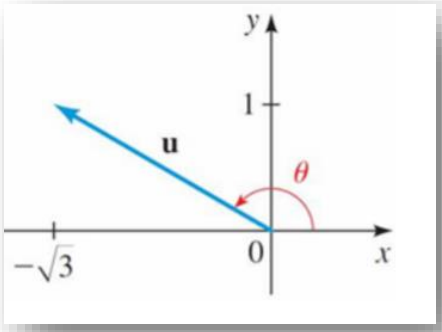
B) $135°$

C) $30°$

D) $60°$

E) $120°$

In the adjacent figure, the magnitude M and the direction θ of the vector u, is



A) $M = 2,\ \theta = \frac{5\pi}{6}$

B) $\mathrm{M} = \sqrt{2},\ \theta = \frac{5\pi}{6}$

C) $\mathrm{M} = \sqrt{2},\ \theta = \frac{2\pi}{3}$

D) $\mathrm{M} = 2,\ \theta = \frac{2\pi}{3}$

E) $\mathrm{M} = 2,\ \theta = \frac{11\pi}{6}$

Given the vectors $u = \langle -4,10 \rangle$, and $v = \langle -5,1 \rangle$. If the vector $w = \langle a, b \rangle$ is a unit vector in the opposite direction of $\frac{1}{2}u - v$, then $a + b$ is equal to

a. $-\frac{7}{5}$

b. $-\frac{3}{5}$

c. $-\frac{2}{5}$

d. $-\frac{4}{5}$

e. $-\frac{9}{5}$

Let $u = \langle -6,1 \rangle$ and $v = \langle -4,3 \rangle$. If $w = 4u - 3v$, then a unit vector having the same direction as w is

A) $\langle -\frac{12}{13}, -\frac{5}{13} \rangle$

B) $\langle \frac{12}{13}, -\frac{5}{13} \rangle$

C) $\langle -\frac{12}{13}, \frac{5}{13} \rangle$

D) $\langle \frac{4}{5}, -\frac{3}{5} \rangle$

E) $\langle \frac{1}{\sqrt{2}}, \frac{1}{\sqrt{2}} \rangle$