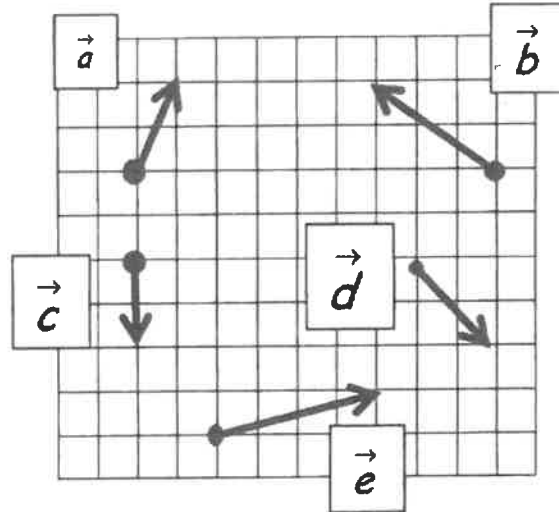


Vectors - Drawing, Component Form and Operations

Use these vectors using the given dot as the starting point to work the problems involving magnitude, direction, component form and operations.

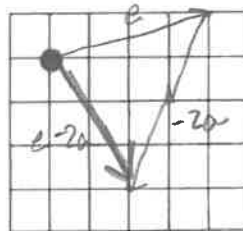


Use the dot as a starting point on the grid below to combine the vectors from above.

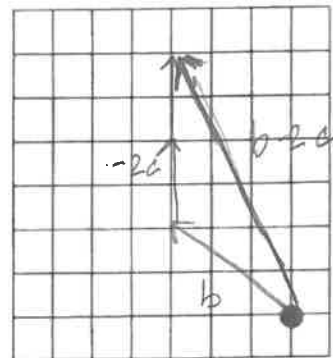
1. $2\vec{c} + \vec{d}$



2. $\vec{e} - 2\vec{a}$



3. $\vec{b} - 2\vec{c}$



4a. Find the component form of the vector \overline{AB} for the points A (3, -2) and B (-2, 7).

$$\langle -2-3, 7+2 \rangle = \langle -5, 9 \rangle \quad \text{Q II}$$

b. Find the unit vector.

$$\|AB\| = \sqrt{25+81} = \sqrt{106} \quad \left\langle \frac{-5}{\sqrt{106}}, \frac{9}{\sqrt{106}} \right\rangle$$

c. Find the trig component form of \overline{AB} . (calc ok)

$$\tan \theta = \frac{9}{-5} \quad \langle \sqrt{106} \cos 119.05, \sqrt{106} \sin 119.05 \rangle$$

$$\text{RAD} = 60.95$$

5a. Find the standard unit vector form of the vector \overline{AB} for the points A (4, -1) and B (-5, -2).

$$-9i - j \quad \text{Q III}$$

b. Find the standard unit trig vector form of \overline{AB} . (calc ok)

$$\|AB\| = \sqrt{81+1} = \sqrt{82} \quad \sqrt{82} i \cos 186.34 + \sqrt{82} j \sin 186.34$$

$$\tan \theta = \frac{1}{-9}$$

$$\theta = 186.34$$

c. Find a vector (in standard unit vector form) in the same direction as \overline{AB} with a magnitude of 8.

$$-9i - j : \quad 8 \left(\frac{-9}{\sqrt{82}} i - \frac{1}{\sqrt{82}} j \right) = \frac{-72}{\sqrt{82}} i - \frac{8}{\sqrt{82}} j$$

6. Let $\vec{v} = \langle -6, 3 \rangle$ and $\vec{w} = \langle 8, -3 \rangle$. Find the following vectors in component form.

a. $-3\vec{v} - 8\vec{w}$

$$-3\langle -6, 3 \rangle - 8\langle 8, -3 \rangle$$

$$\langle 18, -9 \rangle + \langle -64, 24 \rangle = \langle -46, 15 \rangle$$

b. $\frac{1}{2}\vec{w} - \frac{3}{2}\vec{v}$

$$\frac{1}{2}\langle 8, -3 \rangle - \frac{3}{2}\langle -6, 3 \rangle$$

$$\langle 4, -\frac{3}{2} \rangle + \langle 9, -\frac{9}{2} \rangle =$$

$$\langle 13, -6 \rangle$$

7. Find the angle between the vectors in problem #6. (calc ok)

$$u \cdot v = -57$$

$$\cos \theta = \frac{-57}{\sqrt{4573}}$$

$$\|u\| = \sqrt{45}$$

$$\theta = 173.99$$

$$\|v\| = \sqrt{73}$$