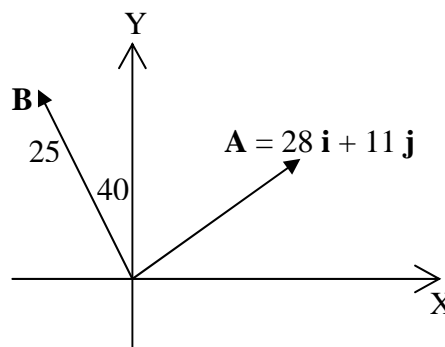


Chapter 3 (Vectors)

- 1- The angle between vector $\mathbf{B} = 4.0 \mathbf{j} + 3.0 \mathbf{k}$, and the positive y axis is approximately: (A: 37 degrees)
- 2- Vector $\mathbf{A} = (5.0 \mathbf{i} + 3.0 \mathbf{j}) \text{ m}$, and vector \mathbf{B} is 6m in length and making 120 degrees angle with +ve x-axis. Find $\mathbf{A}-\mathbf{B}$. (A: $(8.0 \mathbf{i} - 2.2 \mathbf{j}) \text{ m}$)
- 3- If $\mathbf{a} = (3.0 \mathbf{i} + 4.0 \mathbf{j}) \text{ m}$ and $\mathbf{b} = (5.0 \mathbf{i} - 2.0 \mathbf{j}) \text{ m}$, find the angle between the two vectors. (A: 75 degrees)
- 4- For the following three vectors;
 $\mathbf{A} = 2 \mathbf{i} + 3 \mathbf{j} + 4 \mathbf{k}$, $\mathbf{B} = 4 \mathbf{i} + 4 \mathbf{j}$ and $\mathbf{C} = 2 \mathbf{i} + 2 \mathbf{k}$, find $\mathbf{A} \cdot (\mathbf{B} \times \mathbf{A})$. (A: 0)
- 5- A vector in the xy-plane has a magnitude of 25.0 and an x-component of 12.0. The angle that it makes with the positive x-axis is: (A: 61.3 degrees)
- 6- The unit vectors in the positive directions of the x, y, and z axes are labeled \mathbf{i} , \mathbf{j} , and \mathbf{k} . The value of $[\mathbf{i} \cdot (\mathbf{j} \times \mathbf{k})]$ is: (A: +1)
- 7- Two vectors $\mathbf{A} = 3 \mathbf{i} + \mathbf{j} + 2 \mathbf{k}$ and $\mathbf{B} = 2 \mathbf{i} + 4 \mathbf{j} - q \mathbf{k}$ (q is a constant) are perpendicular to each other. Find the constant q . (A: 5)

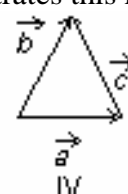
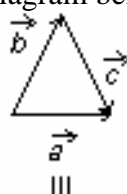
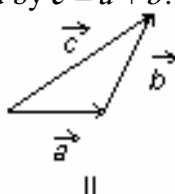
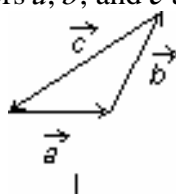
- 8- If vector $\mathbf{A} = 28 \mathbf{i} + 11 \mathbf{j}$ and vector \mathbf{B} (magnitude of $B = 25$) as shown in the figure, what is the magnitude of the sum of these two vectors? (A: 32)



- 9- Vector $\mathbf{A} = -6 \mathbf{i} + 14 \mathbf{j}$. Find vector \mathbf{B} whose magnitude is twice that of \mathbf{A} and is opposite in direction to \mathbf{A} . (A: $12 \mathbf{i} - 28 \mathbf{j}$)

- 10- If vector $\mathbf{A} = 6 \mathbf{i} - 7 \mathbf{j}$ and vector $\mathbf{B} = -12 \mathbf{i} + 10 \mathbf{j}$, what angle does vector $\mathbf{C} = 2 \cdot \mathbf{A} - \mathbf{B}$ make with +x-axis measured counterclockwise. (A: 315°)

- 11- The vectors \vec{a} , \vec{b} , and \vec{c} are related by $\vec{c} = \vec{a} + \vec{b}$. Which diagram below illustrates this relationship? (A: II)



- 12- A vector of magnitude 3 CANNOT be added to a vector of magnitude 4 so that the magnitude of the resultant is: (A: zero)

A) zero B)1 C) 3 D) 5 E)7