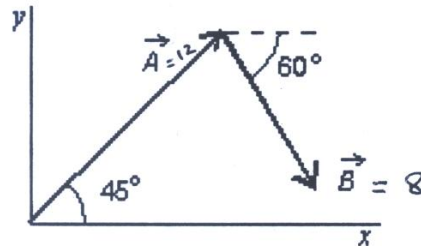


Key

Name: \_\_\_\_\_

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In the diagram,  $\vec{A}$  has magnitude 12 and makes an angle of 45 with the +ve x-axis counterclockwise, while  $\vec{B}$  has magnitude 8 and makes an angle of 60 with the +ve x-axis clockwise.



a- Resolve vectors A and B to components.

$$A_x = 12 \cos 45 = 8.5$$

$$A_y = 12 \sin 45 = 8.5$$

$$B_x = 8 \cos 60 = 4$$

$$B_y = -8 \sin 60 = -6.9$$

b- Find the components of the resultant vector  $\mathbf{R} = \mathbf{A} + \mathbf{B}$ .

$$R_x = A_x + B_x = 8.5 + 4 = 12.5$$

$$R_y = A_y + B_y = 8.5 - 6.9 = 1.6$$

c- Find the magnitude of vector R.

$$|\mathbf{R}| = \sqrt{R_x^2 + R_y^2} = \sqrt{(12.5)^2 + (1.6)^2} = 12.6$$

d- Find the direction of vector R (the angle from +ve x-axis).

$$\theta = \tan^{-1} \left( \frac{R_y}{R_x} \right) = \tan^{-1} \frac{1.6}{12.5} = 7.3^\circ$$

e- In which quadrant is vector R located?

Since  $R_x$  is positive

and  $R_y$  " "

$\Rightarrow \vec{R}$  is in the 1<sup>st</sup> Quadrant.