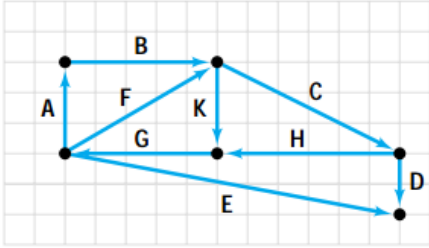


Precalculus Unit 9: 9.3 Vector Application Problems (10 points)

1. Use the picture to determine if each of the following statements are true or false.



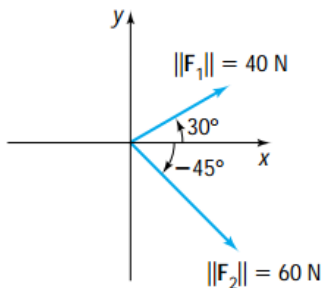
- | | |
|---|--|
| a. $\mathbf{A} + \mathbf{B} = \mathbf{F}$ | e. $\mathbf{K} + \mathbf{G} = \mathbf{F}$ |
| b. $\mathbf{C} = \mathbf{D} - \mathbf{E} + \mathbf{F}$ | f. $\mathbf{G} + \mathbf{H} + \mathbf{E} = \mathbf{D}$ |
| c. $\mathbf{E} + \mathbf{D} = \mathbf{G} + \mathbf{H}$ | g. $\mathbf{H} - \mathbf{C} = \mathbf{G} - \mathbf{F}$ |
| d. $\mathbf{A} + \mathbf{B} + \mathbf{K} + \mathbf{G} = \mathbf{0}$ | h. $\mathbf{A} + \mathbf{B} + \mathbf{C} + \mathbf{H} + \mathbf{G} = \mathbf{0}$ |

2. Find the component form and the magnitude of the vector with an initial point $(5, -4)$ and terminal point $(4, 1)$.

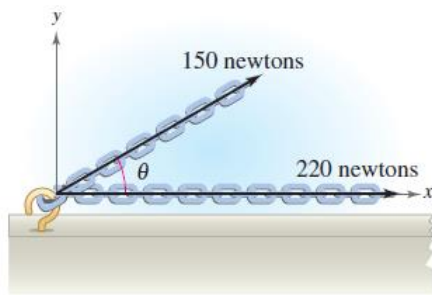
3. Find a unit vector in the same direction as $\vec{v} = \langle 5, 12 \rangle$.

4. A child pulls a wagon with a force of 40 pounds. The handle of the wagon makes a 40° angle with the ground. Express the force vector \vec{F} as a linear combination in terms of \vec{i} and \vec{j} .

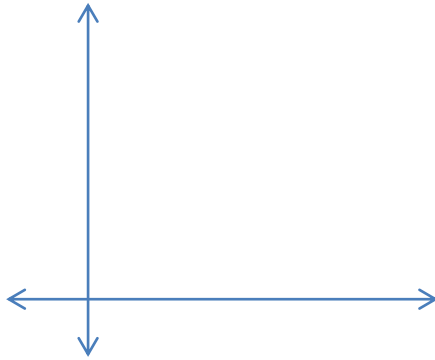
5. Two forces of magnitude 40 Newtons and 60 Newtons act on an object at angles of 30° and -45° with the positive x -axis as shown in the figure. Find the direction and the magnitude of the resultant force.



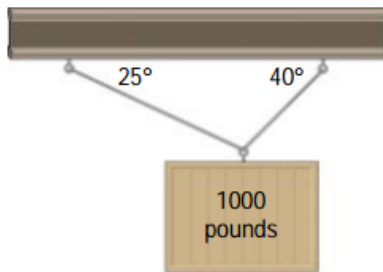
6. Two forces with magnitudes of 150 Newtons and 220 Newtons act on a hook as shown in the diagram. Find the direction and magnitude of the resultant force when $\theta = 30^\circ$.



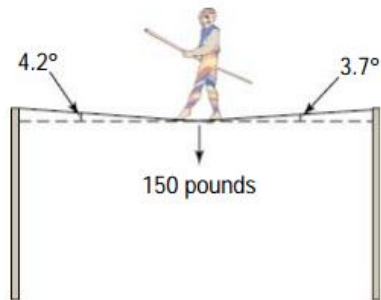
7. Find the angle between the forces given that force 1 has a magnitude of 45 pounds, force 2 has a magnitude of 60 pounds, and their resultant vector has a magnitude of 90 pounds.



8. A weight of 1000 pounds is suspended from two cables as shown in the figure. What is the tension in the two cables?



9. A tightrope walker located at a certain point deflects the rope as indicated in the figure with angles of 4.2° and 3.7° . If the weight of the tightrope walker is 150 pounds, how much tension is in each part of the rope?



10. Show on the following graph the force needed for the object at P to be in static equilibrium.

