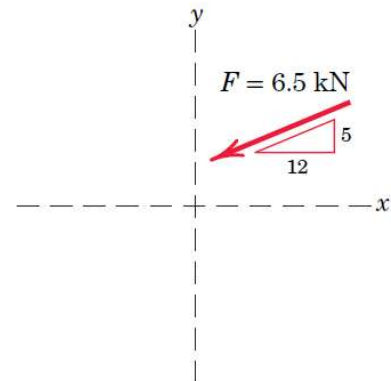


## Solution of Problem 2/3 Vector Notation of Force Vector

2/3 The slope of the 6.5-kN force **F** is specified as shown in the figure. Express **F** as a vector in terms of the unit vectors **i** and **j**.

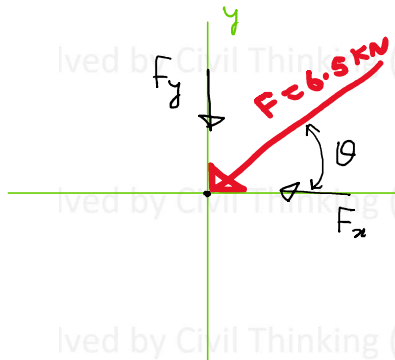
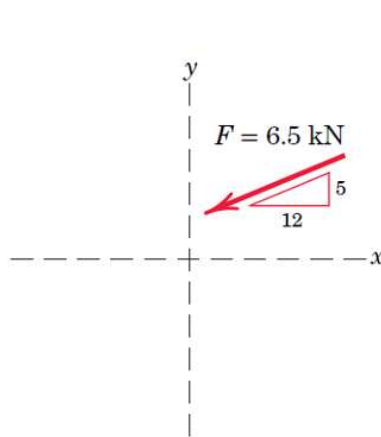
**2/3 SS** The slope of the 6.5-kN force **F** is specified as shown in the figure. Express **F** as a vector in terms of the unit vectors **i** and **j**.



PROBLEM 2/3

Solution:

An inclined force always have components along x and y axes.



$$\theta = \tan^{-1}\left(\frac{5}{12}\right) \approx 22.62^\circ$$

$F_x$  acts towards left  
 $\Rightarrow$  Negative

$F_y$  acts downwards  
 $\Rightarrow$  Negative.

$$F_x = -F \cdot \cos(\theta) = -6.5 \cdot \cos(22.62^\circ) \approx -6 \text{ kN}$$

$$F_y = -F \cdot \sin(\theta) = -6.5 \cdot \sin(22.62^\circ) \approx -2.5 \text{ kN}$$

A force vector **F** can be rewritten in vector notation as:

$$\mathbf{F} = F_x \mathbf{i} + F_y \mathbf{j}$$

$$\Rightarrow \mathbf{F} = -6\mathbf{i} - 2.5\mathbf{j} \text{ kN Answer}$$

If you need **online tutoring** in Statics and Mechanics, you can book your class at

<https://civilthinking.com/book-online-class>

Our interactive, 1-on-1 sessions are designed so you do not need extra homework afterward. These Statics sessions are perfect for students looking to pass university tests, quizzes, and final exams. We welcome students from all countries, and you can easily choose the best time based on your local time zone.