

## Answer on Question #51982 – Physics – Other

### Question.

A man walks 5.0m due east and then 10.0m N30°E. Find his resultant displacement.

Given:

$$L_1 = 5 \text{ m}$$

$$L_2 = 10 \text{ m}$$

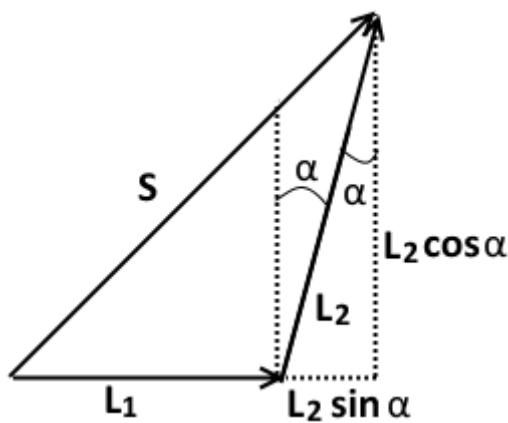
$$\alpha = 30^\circ$$

Find:

$$S = ?$$

### Solution.

Let use the picture to solve this problem:



As it is shown from the figure:

$$S^2 = (L_1 + L_2 \sin \alpha)^2 + (L_2 \cos \alpha)^2$$

Therefore,

$$S = \sqrt{(L_1 + L_2 \sin \alpha)^2 + (L_2 \cos \alpha)^2}$$

Calculate:

$$\begin{aligned} S &= \sqrt{(L_1 + L_2 \sin \alpha)^2 + (L_2 \cos \alpha)^2} = \sqrt{(5 + 10/2)^2 + (10\sqrt{3}/2)^2} = \sqrt{100 + 75} = \sqrt{175} = \\ &= 5\sqrt{7} \text{ m} \approx 13.23 \text{ m} \end{aligned}$$

### Answer.

$$S = \sqrt{(L_1 + L_2 \sin \alpha)^2 + (L_2 \cos \alpha)^2} = 5\sqrt{7} \text{ m} \approx 13.23 \text{ m}$$