

Answer on Question #60201-Physics-Mechanics-Relativity

A student walks forward a distance represented by the displacement vector A of magnitude 6.2 m, and then walks to obtain an additional displacement B of length 4.1 perpendicular to A.

(a) What is the magnitude of the resulting displacement from the origin?

(b) What magnitude of total displacement would result if the second displacement were -B instead of B?

Solution

(a)

$$D = \sqrt{A^2 + (B)^2} = \sqrt{(6.2)^2 + (4.1)^2} = 7.4 \text{ m}$$

b) The second displacement -B is also perpendicular to A and has the same magnitude. Thus, the magnitude of total displacement would be

$$D' = \sqrt{A^2 + (B)^2} = \sqrt{(6.2)^2 + (4.1)^2} = D = 7.4 \text{ m}$$