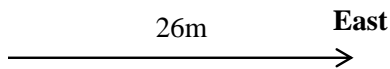


Assignment

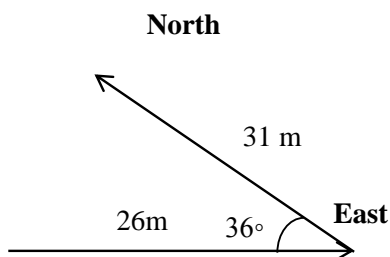
A person walks 26 m East and then walks 31 m at an angle 36° North of East. What is the magnitude of the total displacement?

Solution

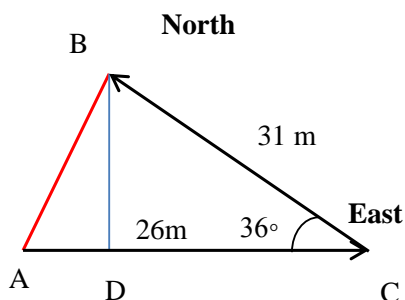
So, firstly a person walks 26 m East:



Then 31 m at an angle 36° North of East:



The next step is to construct the auxiliary lines. We formed the triangle ABC. The magnitude of the total displacement is the segment AB, highlighted in red.



The next step is to calculate the length of the segment DC from the triangle BDC, using the cosine function.

$$\cos 36^\circ = DC/BC$$

$$DC = BC \cdot \cos 36^\circ = 31\text{m} \cdot 0,81 = 25\text{m}$$

Now we can calculate the length of the segment AD:

$$AD = AC - DC = 26\text{m} - 25\text{m} = 1\text{m}$$

Using the Pythagorean theorem we can find the required value (the length of the segment AB):

$$AB^2 = AD^2 + BD^2$$

$$BD^2 = BC^2 - DC^2 = 961 - 625 = 336$$

$$AB^2 = 336 + 1 = 337$$

$$AB = 18,4\text{m}$$