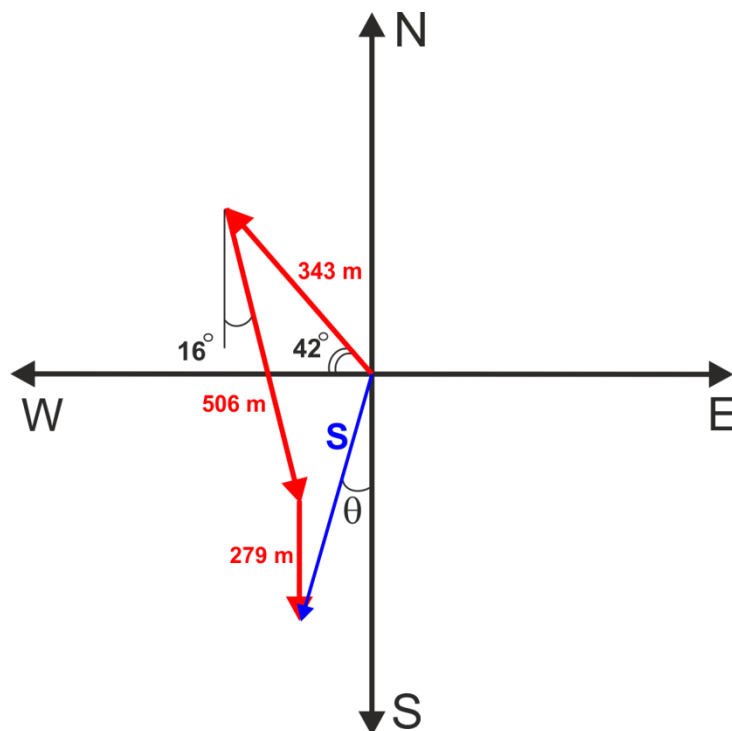


### Answer on Question #83985 Physics / Mechanics Relativity

A person is walking in a park. They start at the entrance. They walk 343m 42 degrees north of west, then 506m 16 degrees east of south, and then 279m due south before they go home. What is their displacement?

**Solution:**



Let the x-axis is directed due to the west and y-axis is directed due to the south.

The components of the displacement

$$S_x = 343 \cos 42^\circ - 506 \sin 16^\circ = 115 \text{ m}$$

$$S_y = -343 \sin 42^\circ + 506 \cos 16^\circ + 279 = 536 \text{ m}$$

So

$$S = \sqrt{S_x^2 + S_y^2} = \sqrt{(115)^2 + (536)^2} = 548 \text{ m}$$

$$\tan \theta = \frac{S_x}{S_y} = \frac{115}{536} = 0.215, \quad \theta = 12^\circ$$

**Answer:** 548 m 12° west of south

Answer provided by <https://www.AssignmentExpert.com>