

Physics 101Rec
Quiz#2-Sect#05
Chapter 3

Name:

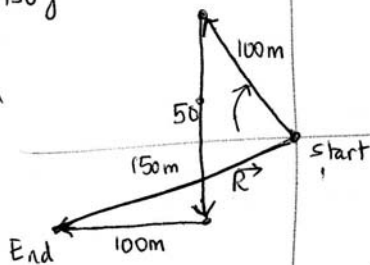
Key

Id:

A person walks 100 m in a direction 50° North of West, then 150 m South, then 100 m West.

- (a) What is the overall displacement of this person in unit vector notation?
(b) What is the direction of the overall displacement relative to the positive x-axis?

$$\vec{A} = 100 \cos 130^\circ \hat{i} + 100 \sin 130^\circ \hat{j}$$
$$\vec{B} = 0 \hat{i} - 150 \hat{j}$$
$$\vec{C} = -100 \hat{i} + 0 \hat{j}$$



$$\vec{R} = \vec{A} + \vec{B} + \vec{C} = -164 \hat{i} - 73 \hat{j}$$

$$\theta = \tan^{-1} \left(\frac{73}{164} \right) = 24^\circ$$

$$\Rightarrow \text{the angle is } 24^\circ + 180^\circ = \boxed{204^\circ}$$