

## Vectors

A vector has a magnitude (often representing distance or speed) and direction. When a clinometer (see Section 4.5) is used to estimate the slope percent and the slope length is measured with a metal tape, the result is a vector. The slope length represent the magnitude and the slope percent can be converted into a slope angle that represents direction. Vectors can provide information about the distance and direction of fire spread, or the speed and direction of fire spread or wind.

Example 1 - Linda is standing at point A. John is standing at point B. John reads the clinometer and finds a slope percent of 25 percent. They measure the slope length and get 18 feet. Draw the vector from point A and then again from point B.

Step 1. Following the steps in Section 4.5, convert the 25 percent to an angle with a calculator using inverse tan ( $\tan^{-1}$ ).

$$\tan A = 0.25, \text{ angle } A = 14^\circ$$

Step 2. Draw the vectors.



## Wind Vectors

Wind is the horizontal movement of air relative to the surface of Earth. Recall from Section 6.2 that the wind direction is named by the direction *from* which the wind is blowing. If the wind is northerly, then the wind is coming from the north. When the wind is blowing into your face, the wind would be named from the direction you are facing. For example, Mandy is facing south and the wind is blowing into her face. The wind is said to be a southerly wind.

## Practice

1. Carol is facing northwest. The wind is blowing into her face. Describe the wind direction.

- northwesterly
- southeasterly
- northeasterly

westerly

Select the correct answer.

2. Carol measures the wind speed in exercise 1 to be 13 mph. How would she draw the vector? The wind vector would be a line representing wind having \_\_\_\_ and drawn at an angle of \_\_\_\_.

- 13 mph speed and  $300^\circ$
- 13 cm length and  $90^\circ$
- 30 m length and  $300^\circ$
- 13 units length and  $315^\circ$

Select the correct answer.