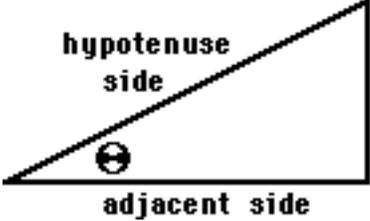


Vector Addition by Components

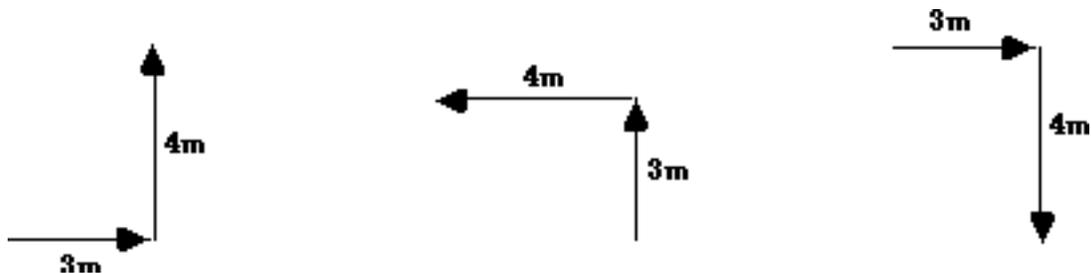
Read from **Lesson 1** of the **Vectors and Motion in Two-Dimensions** chapter at **The Physics Classroom**:

<http://www.physicsclassroom.com/Class/vectors/u3l1eb.cfm>

MOP Connection: Vectors and Projectiles: sublevels 3 and 4

 TIP Trigonometry Review	Trigonometric functions are mathematical functions that relate the length of the sides of a right triangle to the angles of the triangle. The meaning of the functions can be easily remembered by the mnemonic	
SOH CAH TOA		
SOH --> $\sin \theta = \frac{\text{Opposite}}{\text{Hypoteneuse}}$	CAH --> $\cos \theta = \frac{\text{Adjacent}}{\text{Hypoteneuse}}$	TOA --> $\tan \theta = \frac{\text{Opposite}}{\text{Adjacent}}$

1. For the following vector addition diagrams, use Pythagorean Theorem to determine the magnitude of the resultant. Use SOH CAH TOA to determine the direction. **PSAYW**

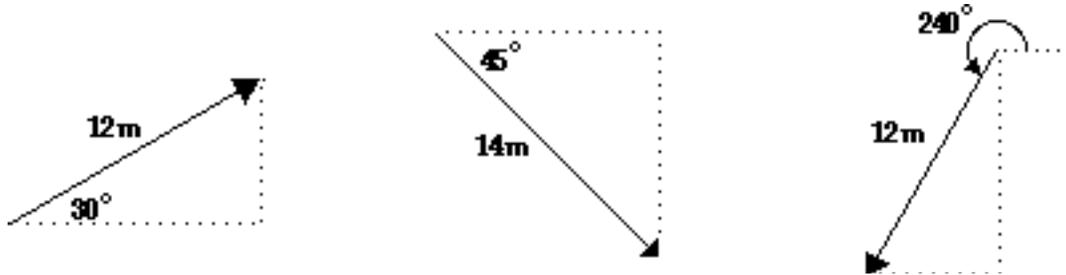


2. Use the Pythagorean Theorem and SOH CAH TOA to determine the magnitude and direction of the following resultants.



Vectors and Projectiles

3. A component is the effect of a vector in a given x- or y- direction. A component can be thought of as the projection of a vector onto the nearest x- or y-axis. SOH CAH TOA allows a student to determine a component from the magnitude and direction of a vector. Determine the components of the following vectors.



4. Consider the following vector diagrams for the displacement of a hiker. For any *angled* vector, use SOH CAH TOA to determine the components. Then sketch the resultant and determine the magnitude and direction of the resultant.

