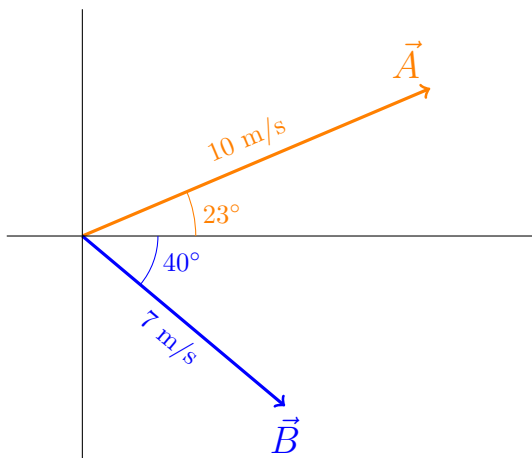


## Chapter 3 Example Problems

### Example Problem 3-1 : *Adding Vectors*

Vectors  $\vec{A}$  and  $\vec{B}$  are shown below.

- (a) Find the components of  $\vec{A}$  and  $\vec{B}$ .
- (b) Sketch out  $\vec{R} = \vec{A} - 2\vec{B}$ .
- (c) Calculate the  $x$ - and  $y$ - components of  $\vec{R}$
- (d) Calculate the magnitude and direction of  $\vec{R}$



**Example Problem 3-2 : *Projectiles Launched Horizontally***

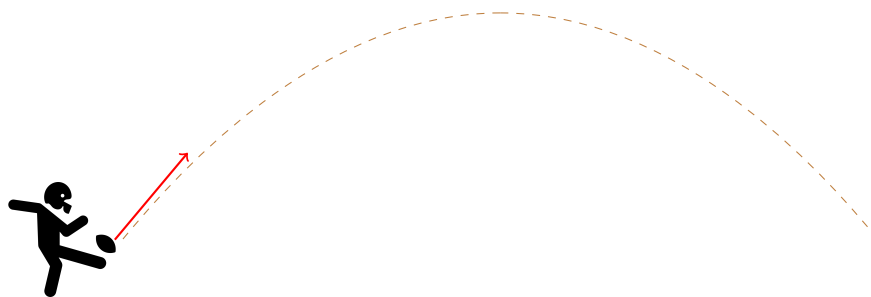
A marble rolls off a 0.8-meter tall table at a horizontal speed of 3 m/s.

- (a) How far from the base of the table will the marble land?
- (b) What is the marble's velocity (magnitude and direction) the moment before it hits the ground?

**Example Problem 3-3 : *Projectiles Launched at an Angle***

A projectile is fired with an initial speed of 36.6 m/s at an angle of 42.2 degrees above horizontal on a long flat firing range.

- (a) What is the maximum height reached by the projectile?
- (b) How much time is the projectile in the air?
- (c) What is the total horizontal distance (that is, range) covered by the projectile?

**Example Problem 3-4**

A football is kicked at an angle off the ground (as shown in the picture above). The football is in the air for 1.2 seconds and travels forward 53 meters.

- (a) Calculate the  $x$ - and  $y$ - components of the football's initial velocity.
- (b) Use these  $x$ - and  $y$ - components to calculate the direction (angle) and magnitude of the football's initial resultant velocity vector.