Chapter 3 Example Problems

Example Problem 3-1 : *Adding Vectors*

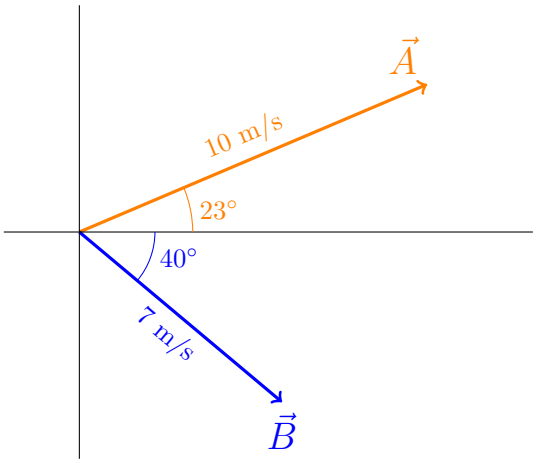
Vectors $\vec{A}$ and $\vec{B}$ are shown below.

(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*

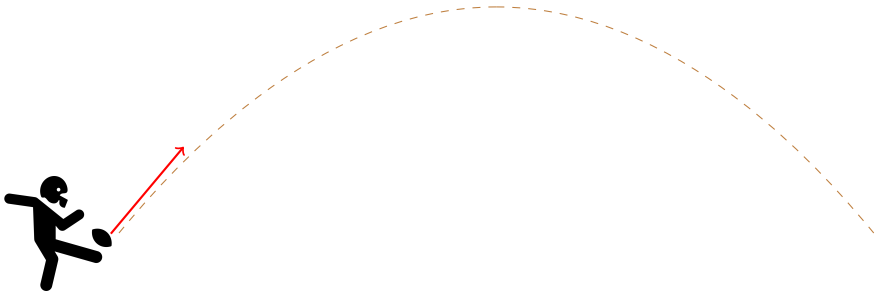
A projectile is fired with an initial speed of 36.6 m/s at an angle of 42.2 degrees above horizontal on a long flat firing range.

(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.