

## Sample Questions Chapter 2: Projectile Motion

- 1) Chad punts a football with a resultant velocity of 18 m/s at an angle of  $48^\circ$ . The ball leaves the foot at a height of 0.8 m. If the ball experiences a constant vertical acceleration of  $-9.8 \text{ m/s}^2$  while it is in the air, what will the ball's position be after 1.5 s?
  
- 2) Phil is trying to dunk a basketball and leaves the ground with a vertical velocity of 3.5 m/s.
  - a. What is Phil's vertical acceleration immediately after takeoff?
  
  - b. What is the peak height Phil's center of gravity will attain if it started at 1.2m?
  
  - c. How much time elapses before Phil will reach his peak height?
  
- 3) A football is thrown by Steve with a vertical velocity of 2 m/s and a horizontal velocity of 20 m/s. Ignoring the effect of air resistance, what will be:
  - a. The flight time until the ball returns to the height it was thrown?
  
  - b. The vertical velocity when the ball returns to the height it was thrown?
  
  - c. The distance downfield Aaron needs to be to catch the ball at the height it was thrown?
  
- 4) A shot put leaves the thrower's hand at 15m/s at an angle of  $42^\circ$  and a height of 1.3m.
  - a. What will be the shot's flight time?
  
  - b. What will be the shot's maximum height?
  
  - c. How far will the shot travel from the thrower's hand before it lands (think about why this may be different from the measured distance)?