Sample Questions Chapter 3: Projectile Motion

1) Chad punts a football with a resultant velocity of 18 m/s at an angle of 48°. The ball leaves the foot at a height of 0.8 m. If the ball experiences a constant vertical acceleration of -9.8 m/s² 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 throwers hand at 15m/s at an angle of 42° and a height of 1.3m.
   a. What will be the shot’s maximum height?
   b. What will be the shot’s flight time?
   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)