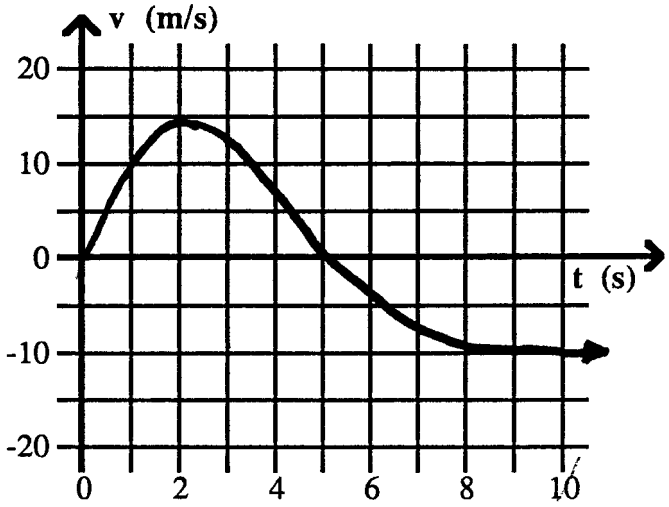
Name:_____

Solve the following problems in the space provided. Use the back of the page if needed. Each problem is worth 20 points. You must show your work in a logical fashion starting with the correctly applied physical principles shown on the last page. Your score will be maximized if your work is easy to follow because partial credit will be awarded.

1. The velocity of an object as a function of time is shown in the graph at the right. Answer the following questions about the object's motion. Be sure to explain your reasoning for full credit.



(a)When is the velocity a maximum?

(b)What is the maximum velocity?

(c)When is the velocity zero?

(d)When is the acceleration zero?

(e) When is the acceleration a maximum?

(f)What is the maximum acceleration?

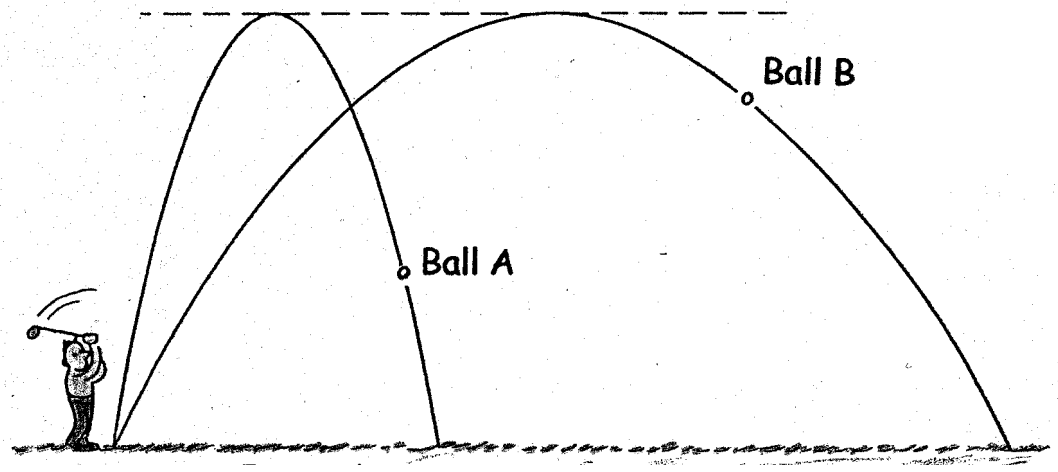
(g)When is the object the farthest away from its starting point?

(h)How can you tell if the object will ever return to its starting point?

2. A runner stealing second base is running at 8.00m/s. Second base is 2.00m away. (a)Find the time for the runner to get to second base assuming she continues running at the same speed. (b)Find the time for the runner to get to second base if she uses a slide to decelerate uniformly to rest right at the base.

3. A golf ball is resting 3.20m northeast of the hole. The golfer putts it and it comes to rest 0.400m due south of the hole. Find the displacement (magnitude and direction) of the golf ball caused by this putt.

4. Pictured below are two possible trajectories of a golf shot. (a)State which shot will stay in the air the longest and (b)which will have the higher launch speed. Completely explain your reasoning for full credit.



5. A car whose speed is increasing at a uniform rate of $0.600 m/s^2$ travels along a curved road that forms a circle of radius 20.0m. At some point along the curve the car has an instantaneous speed of 4.00m/s. Find (a)the tangential component of the acceleration and (b)the radial component of the acceleration and (c)the magnitude of the total acceleration.