1. A balloon is inflating so that its radius at time t seconds is equal to t inches.
(a) At what rate is the volume of the balloon increasing when $t = 3$ seconds?
(b) Show that at any time t the rate of increase of the volume of the balloon is equal to the surface area of the balloon.

2. A man standing on top of a building 120 meters high throws a ball straight upwards into the air with an initial upward velocity of 10 m/s. We will take the acceleration of gravity to be 10 m^2/s (downward). The position of the ball at time t seconds is

$$y(t) = -5t^2 + 10t + 120.$$

(a) When does the ball attain its maximum height?
(b) What is the maximum height attained by the ball?
(c) When does the ball hit the ground?
(d) How fast is the ball going when it hits the ground?

3. A car us traveling at a rate of 100 ft/s when the driver suddenly applies the brakes ($x = 0$, $t = 0$). The position function of the skidding car is $x(t) = 100t - 5t^2$. How far does the car travel before coming to a stop?