3.4 Velocity and Other Rates Day 2

What does the derivative mean?

- Slope
- How fast something is changing
- Instantaneous rate of change

Ex 1) Write an equation relating surface area of a cube with its side length

Find the instantaneous rate of change for surface area with respect to s.

Evaluate A' (1) and A' (2)

Ex 2) Write an equation relating surface area of a sphere with its radius.

Find the instantaneous rate of change for surface area with respect to r.

Evaluate A' (1) and A' (2)

Ex 4) A bullet fired straight up from the moon's surface would reach a height of $s = 832t - 2.6t^2$ after t seconds. How long would it take the bullet to to get back down?

Ex 5) A particle moves along a line so that its position at time t is given by $s(t) = t^3-6t^2+8t+2$ where s is measured in meters and t is measured in seconds with $t \geq 0$.

a) Find displacement during first 5 sec.

b) Find average velocity during first 5 sec.

c) When does the particle change direction.

d) Where is the particle when s is a minimum?

Ex 6) A body's velocity at time t sec is

$$v = 2t^3 - 9t^2 + 12t - 5.$$

Find the body's speed each time the acceleration is zero