The Fundamental Theorem of Calculus II

Example 1: The growth rate of the population of a city is $p'(t) = -200(5 - t)$, where t is time in years. How does the population change from $t = 2$ to $t = 5$ years?

Example 2: A hose is turned on at 8:00 am and water starts to flow into a pool at a rate of $r(t) = 6\sqrt{t}$, where t is time in hours after 8:00 am. $r(t)$ is measured in ft^3/h.

(a) Find how much water flows into the pool between 9:00 am and 12:00 pm.

(b) How many hours after 8:00 am will there be 100 cubic feet of water in the pool?

Example 3: The velocity, in meters per minute, of a particle is $v(t) = 8t - 5$.

(a) Find the displacement of the particle from $t = 3$ to $t = 7$ minutes.

(b) Find the time when the displacement is zero after the particle starts moving.

DIY

1. The acceleration of a car, t seconds after the driver steps on the brake, is $a(t) = -(t - 3)^2$. If distance is measured in meters, what is the decrease in velocity 3 seconds after the brake is applied?