Homework 15

§5.3#19, 27, 46, 47, **32**, **36**

§6.3#7, 9, 11, 13, **26(a,c)***, **30**, **32**

§5.3 #19. Pollution is removed from a lake on day t at a rate of $f(t)$ kg/day.

a) Explain the meaning of the statement $f(12) = 500$

b) If $\int_5^{15} f(t)dt = 4000$, give the units of the 5, the 15, and the 4000

c) Give the meaning of $\int_5^{15} f(t)dt = 4000$

§5.3 #27. The amount of waste a company produces, W, in tons per week, is approximated by $W = 3.75e^{-0.008t}$, where t is in weeks since January 1, 2005. Waste removal for the company costs \$15/ton. How much does the company pay for waste removal during the year 2005?

§5.3 #46 & 47. Let $C(n)$ be a city's cost, in millions of dollars, for plowing the roads when n inches of snow have fallen. Let $c(n) = C'(n)$. Evaluate the expressions and interpret your answers in terms of the cost of plowing snow, given $\int_0^{15} c(n)dn = 7.5$ $c(15) = 0.7$ $c(24) = 0.4$ $C(15) = 8$ $C(24) = 13$

46) $\int_{15}^{24} c(n)dn$

47) $C(0)$

§5.3 #**32**. Water is pumped out of a holding tank at a rate of $5 - 5e^{-0.12t}$ liters/min, where t is in minutes since the pump is started. If the holding tank contains 1000 liters of water when the pump is started, how much water does it hold one hour later?

§5.3 #**36**. Let $f(1) = 7$ and $f'(t) = e^{-t^2}$. Use left- and right-hand sum of 5 rectangles to estimate $f(2)$.

§6.3 #7. Find the general solution to the differential equation $\frac{dy}{dx} = \cos(x)$

§6.3 #9. Find the solution of the initial value problem $\frac{dy}{dx} = 3x^2$ where $y(0) = 5$

§6.3 #11. Find the solution of the initial value problem $\frac{dy}{dx} = e^x$ where $y(0) = 7$

§6.3 #13. A rock is thrown downward with velocity 10 ft/sec from a bridge 100ft above the water. How fast is the rock going when it hits the water?

§6.3 #**26a,c***. a) Find the general solution of the differential equation $\frac{dy}{dx} = 2x + 1$.

c) Find the solution satisfying $y(1) = 5$.

§6.3 #**30**. An object is dropped from a 400-foot tower. When does it hit the ground and how fast is it going at the time of impact?

§6.3 #**32**. A ball that is dropped from a window hits the ground in five seconds. How high is the window? (Give your answer in feet.)