1. A chemical spill results in the contamination of a pond. At time t hours after 8:00AM, the rate at which the chemical is entering the pond is $500e^{-0.5t}$ gallons per day. How many gallons of the chemical entered the pond from 10:00AM to 1:00PM?

2. Evaluate each of the following integrals.

   (a) $\displaystyle\int \frac{x}{(x+2)^2}\, dx$

   (b) $\displaystyle\int \sec(5x+1)\tan(5x+1)\, dx$

   (c) $\displaystyle\int x\sqrt{3+2x}\, dx$

   (d) $\displaystyle\int \frac{e^{\sqrt{x}}}{\sqrt{x}}\, dx$

   (e) $\displaystyle\int \cos^3 x\, dx$ (Hint: First use the identity $\cos^2 x = 1 - \sin^2 x$.)

   (f) $\displaystyle\int \frac{3}{\sqrt{25-9x^2}}\, dx$

3. Find the area of each region.

   (a) The region between the graphs of $f(x) = 3x$ and $g(x) = 8x - x^2$.

   (b) The region bounded by the line $y = 6 - x$ and the curve $y = \dfrac{6}{x}$.