Math 121 Review, Practice Problem Set 2
(Based on Chapter 6 and 7)

1. Evaluate the following integrals.

   i.
   $$\int \frac{dx}{\tan x + \sin x}$$

   ii.
   $$\frac{x^{1/2}\,dx}{1 + x^{1/3}}$$

   iii.
   $$\frac{x^2\,dx}{2x^2 - 3}$$

   iv.
   $$\frac{10^{\sqrt{x+2}}\,dx}{\sqrt{x+2}}$$

2. State whether the following integrals converge or diverge, and justify your claim.

   i.
   $$\int_2^\infty \frac{dx}{\sqrt{x}\ln x}$$

   ii.
   $$\int_0^\infty \frac{dx}{\sqrt{x} + x^2}$$

3. Solve the integral equatoin
   $$y(x) = 3 + \int_0^x e^{-y(t)}\,dt$$

4. Find the centroid of the plane region $x \geq 0$, $y \geq 0$, $x^2 + 4y^2 \leq 4$.