MATH 141, FALL 2010, MIDTERM 1 REVIEW

1) Let $f(x) = \frac{1}{\sqrt{x}}$, and let R be the region between the graph of f and the x axis on $[1, 2]$. Find the volume V of the solid obtained by revolving R about the x axis. [NO PARTIAL CREDIT]

2) Find the area of a surface obtained by rotating the curve given parametrically by

$$x = f(t) = 17^t,$$

and

$$y = g(t) = 17^t,$$

for $0 \leq t \leq 1$, about x axis.

3) Find the center of gravity of the region between the graphs of $f(x) = 11 - x^2$ and $g(x) = x^2 + 3$.

4) A swimming pool has the shape of a circular cylinder with radius 8 feet and depth 10 feet. If the pool contains 8 feet of water, what is the work required to pump all the water to 1 foot above the top of the pool? (The weight of water is 62.5 pounds per cubic foot.)

5) Let R be the region between the graph of function $f(x) = \sin(x^2)$ and the x-axis. Find the volume of the solid obtained by revolving R about the y-axis.