Worksheet week 2 - MAC 2312, Spring 2014 **NAME:** _____

1. Use FTC or geometry to evaluate each integral:

$(a) \int_0^3 |x-2|\, dx$ $(b) \int_1^2 \frac{x^2+1}{x}\, dx$ $(c) \int_{-1}^1 \frac{1}{x^2+1}\, dx$

2. Find the average value of $f(x) = \sec^2 x$, when $x \in [0, \pi/3]$.

3. Given that $F(x) = \int_0^x \sqrt{8t - t^2}\, dt$, for $x \in [0, 8]$, do the following:

(a) Determine the values of $F(0)$, $F(4)$, $F(8)$. Hint: Complete the square and use geometry.
(b) Determine $F'(x)$ and $F''(x)$.
(c) Based on parts (a) and (b), sketch the graph of the function $y = F(x)$, for $x \in [0, 8]$. What kind of point is $x = 4$ for the graph of $y = F(x)$?