Names: _____   Group #: _____

1. Find a parametric representation of the semi-circle above the x-axis of radius 4 centered at the origin.

2. Use the properties of the line parametrization to sketch the graph of the following curves:

   (a) $x = 5t$, $y = 1 - 2t^2$, for $-\infty < t < \infty$

   (b) $x = t^2$, $y = t^3$, for $-\infty < t < \infty$

3. Consider the following parametrization:

$$x = \frac{t^2}{2}, \ y = t + 1, \ \text{for} \ -3 \le t \le 3$$

(a) Using the Theorem for the Derivatives of Parametric Curves, find the slope of the line tangent to this curve at the point $(2, 3)$

(b) Rewrite the parametric curve in terms of one function and confirm the value found in part a)

4. Find the area under the following curves over the indicated interval:

(a) $x = -3t, \ y = 2t, \ \text{for} \ 0 < t < 2$

(b) $x = -3t^2, \ y = 2t, \ \text{for} \ 0 < t < 3$

(c) $x = -3t^2, \ y = 2t^3, \ \text{for} \ 2 < t < 4$