B1.                              **MATH 1700:  Test #1**

**Name: _____**                **Student Number: _____**

**[13] 1.** We are given the curve $x = t^3 - 3t$ , $y = \dfrac{1}{2}t^2 - 2t$ .

　　　(a) Find $\dfrac{dy}{dx}$ at the point when $t = 0$.

　　　　　(b) Find all of the points where the tangent lines are vertical or horizontal. (Note: finding a point means finding the coordinates of that point).

**[12] 2.**        (a) Find some polar coordinates of the point $(2,2)$.

(b) Find the Cartesian coordinates of the point $(\frac{\pi}{3}, 2)$ given in polar coordinates. (I write the polar angle as the first coordinate, the polar distance as the second coordinate.)

(c) Sketch the region defined by the inequalities $2 < r \le 3$ (where $r$ is polar distance).