MATH 162Q, Quest Calculus IIA

Workshop #7

Due Monday November 9, 2009

Group members are required to write up solutions individually. It is important that you write up solutions in your own words. You should explain not only what, but also why you decided to do what you did. You should think of this as an opportunity to reflect on the process that will lead you to a correct solution to similar problems.

Please use this as a cover sheet to your workshop writeup. Make sure all work is stapled and turn it into the professor before class on the due date.

NAME: _____

Please list all your group members, and on a scale from **1 (low) - 5 (high)** rank your and their participation in the workshop. This will not affect grades, rather, it will supply the professor and TA with workshop feedback.

Group Member	Participation

Problem 1. Consider the parametric curve given by the parametric equations

$$x = \frac{3t}{1+t^3}, \quad y = \frac{3t^2}{1+t^3}$$

(a) Show that the curve is symmetric with respect to the line $y = x$. Where does the curve intersect this line?

(b) Find the x and y coordinates of the points on the curve where the tangent lines are horizontal and vertical.

(c) Show that a cartesian equation of this curve is

$$x^3 + y^3 = 3xy.$$

(d) Show that the line $y = -x - 1$ is a slant asymptote of this curve.

(e) Sketch the curve in the xy-plane.

(f) Show that the polar equation of this curve can be written in the form

$$r = \frac{3\sec\theta\tan\theta}{1+\tan^3\theta}.$$

Problem 2. Sketch the polar curve given by the polar equation

$$r^2 = -\cos 2\theta.$$

Give a full explanation and show all your work.