İzmir University of Economics, Department of Mathematics

Матн 205	Analytic Geometry	Exam 1	12.12.2004
Name		Student No.	E-mail

You will not get any points if your answer is wrong, that is no points to your explanations if your answer is wrong. And of course no points to a correct answer if your explanation or proof is not correct or clear.

YOU must write GOOD Mathematics

1. Find the parametric equation of *circle*, *ellipse* and *hyperbola* centered at (x_0, y_0) using their standard equations. SOLUTION:

2. Write the equation of the hyperbola whose center is (-3, 2), one vertex is (-3, 4) and one focus is (-3, -1). Then find the *eccentricity* and *directrices* and *asymptotes*. SOLUTION: 3. Use rotation of axes to find the standard equation of the conic $x^2 + Bxy + y^2 = 1$. Then find the *eccentricity*. SOLUTION:

4. Find the surface area A of the torus generated by revolving the circle $(x-a)^2 + y^2 = r^2$ about the y axis. SOLUTION: 5. Verify that one complete oscillation of the sine curve $y = \sin x$ has the same length L as the ellipse $\frac{1}{2}x^2 + y^2 = 1$. Solution:

6. (a) Show that the "Eight Curve" $x^4 = a^2(x^2 - y^2)$ has polar equation $r^2 = a^2 \cos(2\theta) \sec^4 \theta$. (b) Find the symmetries of this curve. SOLUTION: