

Math 126 D & F- Spring 2007
Midterm 2
May 10, 2007

Name: _____

Student ID Number: _____

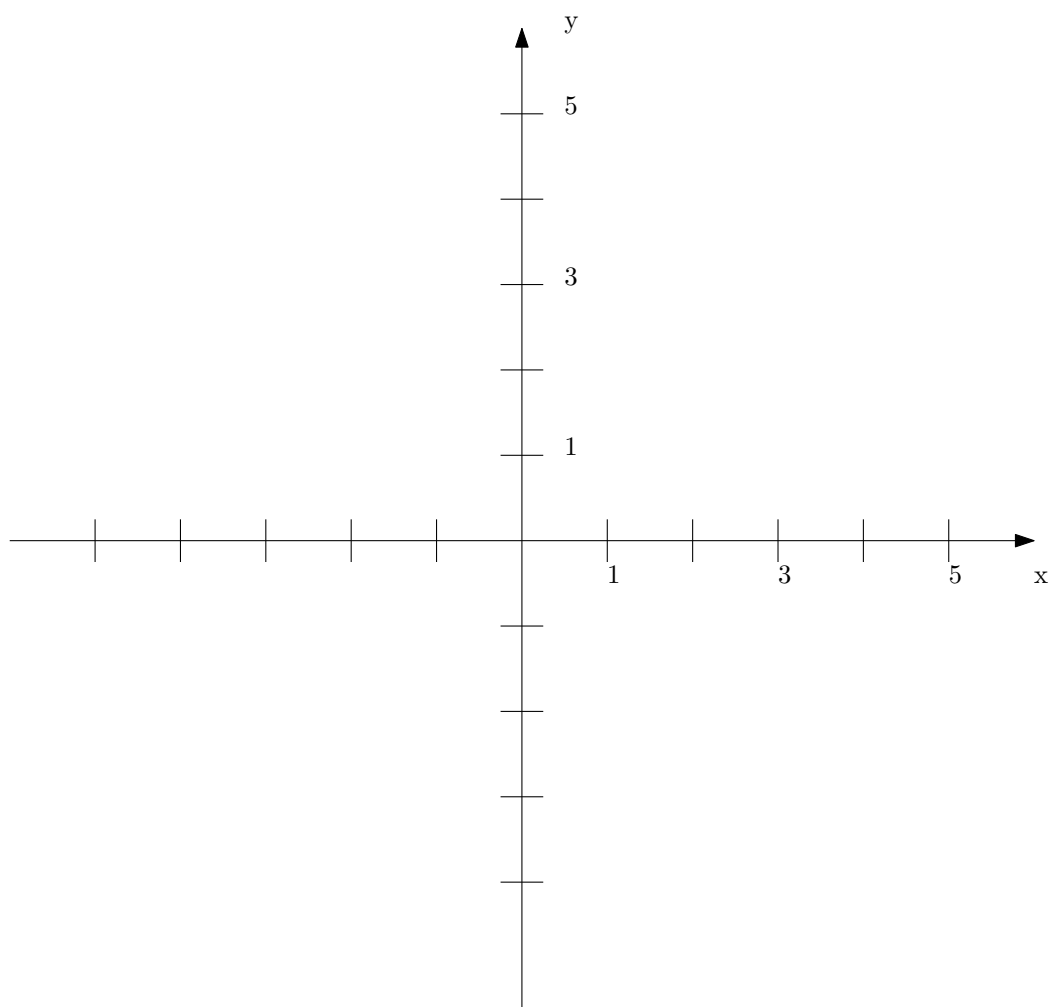
1	10	
2	10	
3	10	
4	15	
5	15	
Total	60	

- You are allowed to use a scientific calculator only (no graphing calculators) and one, **hand-written**, double-sided page of notes.
- Check that your exam contains all the problems listed above.
- You must show your work on all problems. The correct answer with no supporting work may result in no credit.
- If you need more room, use the backs of the pages and indicate to the grader that you have done so.
- Leave answers in exact form.
- Remember to check your work.

1. (10 points) Plot the following polar curve for $0 \leq \theta < 2\pi$

$$r = 1 + \frac{2\theta}{\pi}.$$

Make sure that the intersection of the axes are correct and well labeled.



2. (10 points) Consider the curve $\mathbf{r} = \langle t + 2t^3, t + e^t \rangle$.

(a) Find parametric equations for the tangent line at $(0, 1)$.

(b) Find all t such that the tangent line is vertical.

3. (10 points) Consider the curve $\mathbf{r} = \langle t, t^2, \frac{1}{3}t^3 \rangle$. Find the unit tangent \mathbf{T} and the unit normal \mathbf{N} at the point $(0, 0, 0)$.

4. (15 points) Consider the curve

$$\mathbf{r} = \langle 4t, 3 \cos(t), 3 \sin(t) \rangle.$$

for $0 \leq t \leq 2\pi$. Find:

(a) (5pts) its length

(b) (10pts) its curvature

5. (15 points) Let $z = f(x, y) = \sqrt{e^x/y}$.

(a) Find the domain of f

(b) Calculate f_x , f_y and f_{xy}

(c) Sketch the level curves for $z = 1$ and $z = 2$