

Math 126 C - Spring 2009
Mid-Term Exam Number One
April 21, 2009

Name: _____

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|-------|----|--|
| 1 | 10 | |
| 2 | 10 | |
| 3 | 10 | |
| 4 | 10 | |
| 5 | 10 | |
| Total | 50 | |

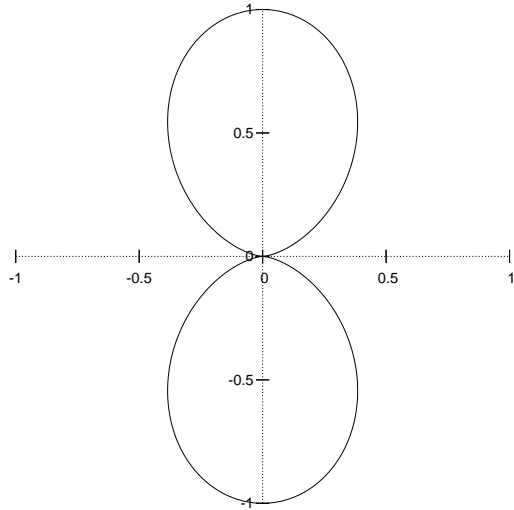
- Complete all questions.
- You may use a scientific, non-graphing calculator during this examination. Other electronic devices are not allowed, and should be turned off for the duration of the exam.
- If you use a trial-and-error or guess-and-check method when an algebraic method is available, you will not receive full credit.
- You may use one hand-written 8.5 by 11 inch page of notes.
- Show all work for full credit.
- You have 50 minutes to complete the exam.

1. (a) Find the equation of the plane P containing the point $(1,2,3)$ which is parallel to the plane containing the points $(0,3,4)$, $(3,2,1)$, and $(5,4,2)$.

(b) Give an example of a line contained in plane P .

2. Thoroughly describe the surface defined as the set of points which are twice as far from the z -axis as they are from the xy -plane.

3. The curve defined by the polar equation $r = \sin^2 \theta$ is shown in the figure below.



(a) Find the slope of the tangent line to the curve at the point where $\theta = \frac{\pi}{4}$.

(b) What is the maximum x -coordinate for a point on this curve?

4. Where does the line which passes through the points $(0, 5, -3)$ and $(1, 2, 8)$ intersect the plane $x - 3y + 4z = 11$?

5. Consider the curve with the vector equation

$$\vec{r}(t) = \langle t^2, 2t^2 - t, 3t - t^2 \rangle$$

Is there a point on this curve where the tangent line is parallel to the vector $\langle 20, 38, -14 \rangle$?
If so, find the point. If not, explain why.