Math 126 C - Spring 2010
Mid-Term Exam Number One
April 20, 2010

Name: _____

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.

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1. Determine whether or not the line

$$x = 4t - 7, y = 5t - 16, z = -2t + 14$$

and the line

$$x = t + 7, y = -3t - 7, z = 7t + 22$$

intersect. If they do, give the point of intersection.

2. Let P be the plane containing the points $(1, 5, 2)$, $(2, 3, 6)$ and $(7, 4, 1)$. Find the intersection of P with the y-axis.

3. Consider the polar curve
$$r = \sin \theta \tan \theta.$$

(a) Find an equivalent cartesian equation for this curve.

(b) The curve has a vertical asymptote. What is the equation of the asymptote?

4. Let S be the surface in 3D consisting of all points which are twice as far from the z-axis as they are from the x-axis.

(a) Give an example of a point on this surface, other than the origin.

(b) Give an equation for this surface.

(c) Describe this surface (if it is a quadric surface, categorizing it (i.e., ellipsoid, eliptic paraboloid, etc.) is sufficient).

5. Let P be the point in the first quadrant on the curve

$$x = \cos t, y = \csc t$$

such that the tangent line to the curve at P passes through the origin. Find the coordinates of P.