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Last Name: _____

First Name: _____

ID: _____ Section: _____

Math 250 Midterm #1. February 20, 2003

Attention! Please, note that this is the closed book test. You are not allowed to use graphing calculator. Simple calculators are allowed. Please, show all important steps in you solution but do not make your solution excessively long.

1. (15pt) The the vector u in Cartesian coordinates is given by

$$u = (1, -3, 2).$$

Find vector of length 10 that is parallel to u .

2. (20pt) Write the equation of the plane passing through the following three points $(1, 2, 3)$, $(-1, 2, 3)$, $(1, 2, 0)$.

3. (15pt) Write the equation of the sphere with the center at the midpoint of the segment connecting points $P_1(1, 0, 3)$ and $P_2(3, 0, 5)$ and with the radius $\sqrt{5}$.

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4. (20pt) Find the coordinates of the vector u if 1) for $w = (1, 0, 0)$

$$u \times w = (0, -3, 4);$$

2) $|u| = 5$.

5. (15pt) Find the Unit Tangent Vector to the curve

$$\begin{cases} x = 3 + t^2, \\ y = 1 - \tan(t), \\ z = 2 + \cos(t), \end{cases}$$

at the point corresponding to time $t = 0$.

6. Sketch the surface in three-space that in Cartesian coordinates is given by the equation

$$z = \sin(y).$$

