V1

1	2	3	4	5	6

Last Name:_____

First Name:_____

ID:_____ Section:____

Math 250 Midterm #1. September 16, 2005

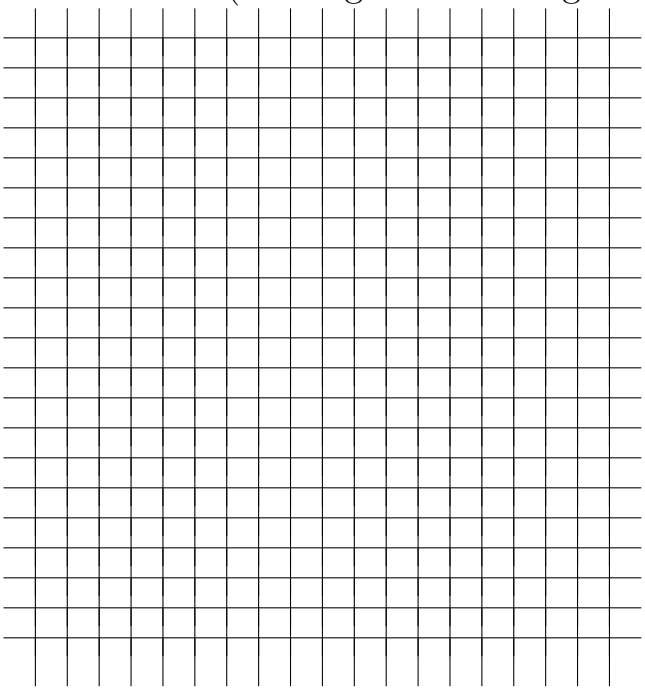
Attention! Please, note that this is the closed book test. You are not allowed to use graphing calculator. Simple calculators are allowed. Please, show all important steps in you solution but do not make your solution excessively long.

1. (15pt) Find the vector QM connecting point $Q(-7, 0.5, 2)$ and the midpoint M of the segment P_0P_1, $P_0(1, 3, -2)$, $P_1(5, -2, -4)$.

2. (20pt) Find distance between the center of the sphere

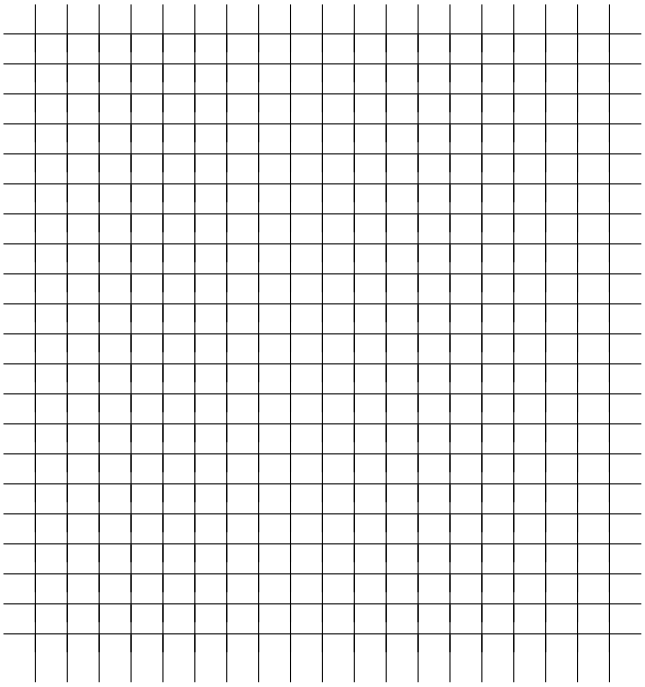
$$x^2 + y^2 + z^2 - 4x + 2y - 2z = 19$$

and the Z-axis. (Making a sketch might be instructive)



3. (15pt) Sketch the graph of the equation

$$-4x + 3y - 6z = 12.$$



4. (20pt) Find equation of the plane that is parallel to both lines

$$\frac{x-3}{2}=\frac{y+1}{-1}=\frac{z-2}{3}, \qquad \frac{x+1}{1}=\frac{y-5}{-2}=\frac{z-4}{2},$$

and passes through $\mathrm{P}(1,4,-2)$.

5. (15pt) Find the angle between the two vectors

$$v = \langle 4, -2, 3 \rangle \qquad \text{and} \qquad u = \langle 2, 5, 0 \rangle.$$

6. (15pt) Find the area of the triangle with $(-1, 2, -3)$, $(3, 2, 1)$, and $(-1, 3, 0)$ as vertices