KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS
DEPARTMENT OF MATHEMATICAL SCIENCES
MATH 201
Exam # 2
April 6, 2004

NAME:	ID#:

SHOW ALL YOUR WORK

1. **(4pts)** Find the equation of the sphere with center at $(2, 3, -1)$ That passes through the point $(4, -1, 1)$.

2. **(4pts)** Find the point C on the line segment joining $A\,(2, 2, 1)$ to $B\,(3, -1, 2)$.

3. **(4pts)** Find the vector component of $\mathbf{v} = 2\mathbf{i} - \mathbf{j} + 3\mathbf{k}$ along $\mathbf{b} = \mathbf{i} + 2\mathbf{j} + 2\mathbf{k}$ and the vector component of $\mathbf{v}$ orthogonal to $\mathbf{b}$.

4. **(4pts)** Find the area of the triangle ABC, where $A = (2, -2, 1)$, $B = (3, -1, 2)$, $C = (3, -2, 3)$.

5. **(4pts)** Find the parametric equations of the line that contains the point $P\,(0,2,1)$ and intersects the line $L : x = 2t,\ y = 1 - 2t,\ z = 3 - t$ at a right angle.

6. **(4pts)** Find parametric equations of the line through the point $(5, 0, -2)$ that is parallel to the planes $x - 4y + 2z = 0$ and $2x + 3y - z + 1 = 0$.

7. **(4pts)** Find the distance between the point $(2, 3, -1)$ and the plane $2x + y + z = 0$.

8. **(4pts)** Locate the point of intersection of the plane $2x + y - z = 0$ and the line through $(3, 1, 0)$ that is perpendicular to the plane.

9. **(4pts)** Find the points of intersection of the line $x = 2t,\ y = 1 - t,\ z = 2 - 3t$ and the coordinate planes

10. **(4pts)** Sketch the surface $z = y^2 - x^2$. What are the traces of this surface in the planes $z = 1,\ z = 0,\ z = 0$?