Math 241 Fall 1997 exam 1

PRINT Your Name:_____

There are 10 problems on 4 pages. Each problem is worth 10 points. SHOW your work. CIRCLE your answer.

NO CALCULATORS!

1. Describe the graph of $xz = 0$ in 3−space.

The graph is the union of the yz plane and the XY plane.

$xz=0$ means either $x=0$ (this is the yz plane) or $z=0$ (this is XY plane).

2. Describe the graph of $x^2 + y^2 = 9$ in 3−space.

In 2 space the graph is a circle of radius 3 with center (0,0).

In 3 space the graph is a cylinder of radius 3, with the z-axis in its center.

3. Find the work done by the force $\vec{F} = 3\vec{i} + 4\vec{j}$ pounds in moving an object from $(1,0)$ to $(6,8)$, distance is measured in feet.

$\text{work} = \vec{F} \cdot \overrightarrow{(1,0)(6,8)} = (3\vec{i} + 4\vec{j}) \cdot (5\vec{i} + 8\vec{j}) = 15 + 32 = 47$ ft