241 Summer 2002 Exam 2

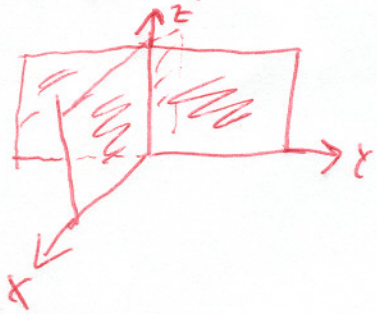
PRINT Your Name:_____

There are 10 problems on 5 pages. Each problem is worth 5 points. SHOW your work. CIRCLE your answer. **NO CALCULATORS!**

I will put your exam outside my office door by noon on Friday. You may pick it up any time before class on Monday. If I know your e-mail address, I will e-mail your score on Exam 2 to you.

1. Graph and describe the graph of $xy = 0$ in 3-space.

The graph is the union of the yz Plane (which is x=0) together with the xz Plane (which is y=0).



2. Graph and describe the graph of the curve whose position vector is

$$\vec{r}(t) = \cos t\,\vec{i} + t\,\vec{j} + \sin t\,\vec{k}$$

in 3-space.

This is $\begin{cases} x = \cos t \\ y = t \\ z = \sin t \end{cases}$. If we ignore the y-coordinate for a moment, the graph looks like a circle in the xz Plane. Now let's think about this y-coordinate. The x and z coordinates run around a circle and y is growing with time. We have a helix which lies on a cylinder with the y-axis down its center