640:251:01-03 **Problems Not Given** **1/29/97**

We'll can't give all of the wonderful (?) problems we think about. Here are a few more which might have been appropriate.

1. A plane intersects a sphere in a circle. What is the center and what is the radius of the circle which results from the sphere of radius 5 centered at $(4, 1, 1)$ intersecting the plane containing the point $(1, 2, -1)$ which has normal vector $\mathbf{i} + 2\mathbf{j}$?

2. The line T whose vector equation is $\mathbf{r} = \langle 2, 3, -1\rangle + t\langle 1, 2, -2\rangle$ intersects the plane $3x - y + z = 4$ at a point, P.

a) What is P?

b) What is the angle between the line and a vector normal to the plane at P?

c) What is the direction of the vector in the plane at the point P which makes the smallest angle with the line, L?