The 3-D Coordinate System
1. Find the distance from the point (-1, 5, 3) to
   (a) the xy-plane                       (b) the xz-plane                      (c) the x-axis

Equations of Lines
For problems 2 & 3 give the vector and parametric form of the equation of given line.
2. The line that passes through (1, -1, 4) and (2, -3, 7).

3. The line that passes through (10, -8, 14) and is parallel to \( \vec{r}(t) = \langle 9, -3 + 6t, 14t \rangle \).

Equations of Planes
For problems 4 & 5 find the equation of the given plane.
4. The plane containing (9, 0, 1), (-1, 1, 4) and (7, 0, 4).

5. The plane containing the point (0, -2, 5) and is orthogonal to \( x = 1 - 3t, y = 7 + 4t, z = 2 + t \).

6. Determine if the two planes \( 5x - y + 3z = 6 \) and \( x - 12z = 7 \) are parallel, orthogonal or neither.

Quadric Surfaces
For problems 7 & 8 sketch the surface. I’m not after a picture perfect sketch here. Your sketch should be recognizable as the proper type of surface that has the correct orientation along the correct axis and be in the proper place on the correct axis.
7. \( y^2 = 7x^2 + 7z^2 \)

8. \( y = 5 - x^2 - z^2 \)