

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 $(4, 5, -2)$ and $(-3, 7, 2)$.

3. The line that passes through $(4, -8, 3)$ and is parallel to the line give by $\vec{r}(t) = \langle 6 - 3t, -5 + t, -4t \rangle$.

Equations of Planes

For problems 4 & 5 find the equation of the given plane.

4. The plane containing $(0, 5, 3)$, $(-1, -3, 3)$ and $(0, 4, -5)$.

5. The plane containing $x = 4 - 5t$, $y = 2 - t$, $z = -6$ and is parallel to $5x - y - 9z = 23$.

6. Determine if the two planes $5x - 9y = -5$ and $3x + 12y - 6z = 6$ are orthogonal, parallel 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. $x = 6y^2 + 6z^2 - 5$

8. $y^2 = 9x^2 + 9z^2$