MA 213 Worksheet #1

Section 12.1

1 (a) *12.1.2* Sketch the points $(1, 5, 3)$, $(0, 2, -3)$, $(-3, 0, 2)$, and $(2, -2, -1)$ on a single set of coordinate axes.

(b) *12.1.3* Which of the points $A(-4, 0, -1)$, $B(3, 1, -5)$, and $C(2, 4, 6)$ is closest to the yz-plane? Which point lies in the xz-plane?

2 *12.1.7* Describe and sketch the surface in $\mathbb{R}^3$ represented by the equation $x + y = 2$.

3 (a) *12.1.15* Find an equation of the sphere that passes through the point $(4, 3, -1)$ and has center $(3, 8, 1)$.

(b) *12.1.45* Find an equation of the set of all points equidistant from the points $A(-1, 5, 3)$ and $B(6, 2, -2)$. Describe the set.

4 *12.1.35* Describe in words the region of $\mathbb{R}^3$ represented by

$$1 \leq x^2 + y^2 + z^2 \leq 5.$$

Draw a sketch of the region.

Additional Recommended Problems

5 *12.1.17* Show that the equation

$$x^2 + y^2 + z^2 - 2x - 4y + 8z = 15$$

represents the equation of a sphere. Find its radius and center.

6 *12.1.40* Write inequalities to describe the solid that lies on or below the plane $z = 8$ and on or above the disc in the xy plane with center the origin and radius 2

7 *12.1.47* Find the distance between the spheres $x^2+y^2+z^2 = 4$ and $x^2+y^2+z^2 = 4x+4y+4z-11$.