Problem Set 6

1. Find a vector equation and parametric equations for the line through the point (6, -5, 2) and parallel to the vector $< 1, 3, -\frac{2}{3} >$.

2. Find parametric equations and symmetric equations for the line through the points (1.0, 2.4, 4.6) and (2.6, 1.2, 0.3).

3. Determine whether L_1 and L_2 are parallel, skew, or intersecting. If they intersect, find the point of intersection.
L_1: $x = 3 + 2t$, $y = 4 – t$, $z = 1 + 3t$
L_2: $x = 1 + 4s$, $y = 3 – 2s$, $z = 4 + 5s$

4. Find an equation of the plane through the point (5, 3, 5) with a normal vector $2\mathbf{i} + \mathbf{j} – \mathbf{k}$.

5. Use intercepts to sketch the plane of $2x + 5y + z = 10$

6. Find the point at which the given line intersects the given plane.
$x = 3 – t$, $y = 2 + t$, $z = 5t$
$x – y + 2z = 9$

7. Determine whether the two planes are parallel, perpendicular, or neither. If neither, find the angle between them.
$x + 4y – 3z = 1$
$-3x + 6y + 7z = 0$

8. Find parametric equations for the line of intersection of the planes and find the angle between the planes:
$x + y + z = 1$
$x + 2y + 2z = 1$

9. Find the distance between the point (1, -2, 4) and the plane $3x + 2y + 6z = 5$.

10. Find the distance between the two planes:
$2x – 3y + z = 4$
$4x – 6y + 2z = 3$