Math 211 Lines and Planes Practice

1. Suppose two projectiles follow these two paths:

$$\text{Projectile \#1: } x = -3t + 1, y = 4t + 1, z = 2t + 4$$
$$\text{Projectile \#2: } x = 3t + 1, y = 2t + 4, z = -2t + 4$$

   Will the two projectiles collide? If so, what is the point of intersection of their paths?

2. Are the planes given by $x - y + z = 9$ and $x + 2y + z = 3$ orthogonal?

3. Find an equation of the plane passing through the points (2,3,-2), (3,4,2), and (1,-1,0).

4. Find an equation of the plane that contains the line of intersection of the planes $x + y + z = 1$ and $3x - y - z = 1$ and is perpendicular to the plane $x + 2y + z = 0$.