1. Determine where, if anywhere, the two lines intersect

\[ \mathbf{r}_1(t) = (0, 2, 9) + t(3, 4, -1) \]
\[ \mathbf{r}_2(t) = (6, 4, 5) + t(0, 6, 2) \]

**Lecture Problems**

2. Find the equation of the plane that goes through the points

\[ p_1 = (1, 2, 3), \quad p_2 = (1, 3, 2), \quad p_3 = (-1, 3, 10) \]

3. Find the distance between the point \( P = (2, 10, 1) \) and the plane \( x + y - 2z = 5 \).

4. Calculate the cross product

\[ (1, 2, 5) \times (-1, 2, -1) = \]

5. Find two different unit vectors both orthogonal to \( (1, 2, 5) \) and \( (-1, 2, -1) \).