1. Determine whether or not \((2, 1, 6), (4, 7, 9),\) and \((8, 5, -6)\) form the vertices of a right triangle.

2. Find \(\mathbf{r}(t)\) if \(\mathbf{a}(t) = (0, -32), \mathbf{v}(0) = (0, 0),\) and \(\mathbf{r}(0) = (0, 1)\).

3. Find equation of the plane through \((-1, 2, -3)\) and parallel to the plane \(2x + 4y - z = 6\).

4. Show that if the speed of a parametric curve is constant, then its velocity and acceleration vectors are perpendicular.

5. Show that the diagonals of a rhombus are perpendicular.

Each problem is worth 20 points