Name:

1. Show that the point $P(1, 2, 3)$ lies on the plane defined by $2x + 3y - z = 5$.

$P(1,2,3)$ $2x+3y-z=5$

$\langle 2, 3, -1 \rangle$

$2+3(2)-3=5$

2. Find the "parametric equation" of the line that passes through $P(1, 2, 3)$ and is perpendicular to the plane from problem 1.

$\langle 1,2,3 \rangle + t\langle 2,3,-1 \rangle = \emptyset$

$\langle 2t, 3t, -t \rangle$

$x \quad y \quad z$

$2t+1$

$3t+2$

$3-t$

$\frac{x-1}{2} =$

b onto a

$\text{Proj}_{\vec{a}}\vec{b} = \left(\frac{a \cdot b}{\|a\|^2}\right)a$

3. Find a vector perpendicular to the vectors $\mathbf{v} = \langle 1, 2, 1 \rangle$ and $\mathbf{w} = \langle 3, 1, 1 \rangle$.

$\mathbf{v} \times \mathbf{w}$

4. Find the equation of a plane that passes through the points $O(0, 0, 0)$, $P(1, 2, 1)$ and $Q(3, 1, 1)$.

5. Find the equation of a plane that is parallel to the plane you found in problem 4 but that passes through the point $R(5, 1, 0)$.