1. Find a vector equation for the line through the point \((6, -5, 2)\) and parallel to the vector \(\langle 1, 3, -2 \rangle\).

Find parametric equations for the line.

2. Find a vector equation for the line through the points \((-8, 1, 4)\) and \((3, -2, 4)\).

Find parametric equations for the line.

3. Find a vector equation for the line through the point \((2, 4, 6)\) and parallel to the line \(x = -1 + 2t, y = 6 - 3t, z = 3 + 9t\)

Find parametric equations for the line.
4. Two lines $L_1$ and $L_2$ have parametric equations given below. Determine whether they are parallel, skew, or intersecting. If they intersect, find the point of intersection.

$L_1 : x = 2 + t, y = 3 - 2t, z = 1 - 3t$
$L_2 : x = 3 + t, y = -4 + 3t, z = 2 - 7t$

5. Two lines $L_1$ and $L_2$ have vector equations given below. Determine whether they are parallel, skew, or intersecting. If they intersect, find the point of intersection.

$L_1 : \langle5, 3, 1\rangle + (-12, 9, -3)t$
$L_2 : \langle3, 0, 7\rangle + (8, -6, 2)t$

6. Find the point where the line $\langle2, 0, 1\rangle + (-2, 3, 1)t$ intersects the plane $x + 2y - z = 7$. 
7. Find an equation of the plane perpendicular to the line \((0, 2, 3) + (3, -1, 4)t\) and containing the point \((2, 0, 1)\).

8. Find an equation of the plane parallel to the plane \(5x + 2y + z = 8\) and containing the line \((1, 3, 5) + (1, -1, -3)t\).

9. Find an equation of the plane through the origin and the points \((3, -2, 1)\) and \((1, 1, 1)\).

10. Find an equation of the plane through the point \((3, 5, -1)\) and containing the line \((4, -1, 0) + (-1, 2, -3)t\).
11. Find an equation of the plane containing the lines \((1, 2, 3) + (4, 5, 0)t\) and \((-3, -3, 3) + (-2, 4, 1)t\).

12. Find a vector equation for the line of intersection of the planes \(x + y + z = 1\) and \(x + 2y + 2z = 1\).

13. Determine whether the planes \(5x + 2y + 3z = 2\) and \(-4x + y + 6z = 3\) are parallel, perpendicular, or neither.