

- 1) Find the unit vectors which are perpendicular to both of the vectors $\mathbf{u} = \mathbf{j} + 4\mathbf{k}$ and $\mathbf{v} = 3\mathbf{i} + 2\mathbf{j} + 4\mathbf{k}$.
- 2) Find the equation of the line determined by the points $A(1,9,5)$ and $B(3,5,7)$ in:
- vector form
 - parametric form
 - symmetric form
- Find also where the line intersects the x,y plane.
- 3) (i) Obtain the equation of the plane Π determined by the points $A(1,2,-2)$, $B(3,3,-3)$ and $C(2,4,-1)$.
- (ii) If L is the line $\frac{x-1}{2} = \frac{y-2}{1} = \frac{z+2}{3}$ through A , find, in parametric form, the equation of the line L' through A , lying in the plane Π and perpendicular to L .
- 4) Find the point where the line $\frac{x+4}{-2} = \frac{y-1}{0} = \frac{z-9}{4}$ intersects the plane $2x + 2y - z = 5$.
- 5) A line L is the intersection of the two planes,
- $$\Pi_1: x + y + z = 1 \qquad \Pi_2: x - 2y + 3z = 2$$
- Find the equation of the plane containing L and passing through the origin.