

4 - Plane

- If any plane pass through a point (x_1, y_1, z_1) and the direction ratios are a, b, c then the equation of the plane is :

$$a(x - x_1) + b(y - y_1) + c(z - z_1) = 0$$

- Length of the normal of a plane $ax + by + cz = d$ is $|\frac{d}{\sqrt{a^2+b^2+c^2}}|$
- the direction ratio of a plane is same as the direction ratio of it's normal.

Must do

- just remind

Problem-3: Find the equation of the plane which passes through the point $(1, -5, -2)$ and whose normal has direction ratio $2, 3, -7$.

- the length of normal

Problem-4: Find direction cosines and length of the normal to the plane $9x + 6y - 2z + 7 = 0$.

Problem-8: Find the equation of a plane through $(1, 2, 3)$ and parallel to plane $3x + 4y - 5z = 0$.

- just remind the process

Problem-9: Show that equation of the plane through the point $(-1, 3, 2)$ and perpendicular to the planes $x + 2y - 2z = 5$ and $3x + 3y + 2z = 8$ is $10x - 8y - 3z + 40 = 0$.

Problem-10: Find the equation of the plane which passes through the points $(2, 2, 1)$ and $(9, 3, 6)$ and is perpendicular to the plane $2x + 6y + 6z + 9 = 0$.

• must do

Problem-11: Find the equation of the plane passing through the intersection line of the planes $x - y + 2z - 3 = 0$ and $2x - y - 3z = 0$ and the point $(4, -3, 2)$.

Problem-13: Find the equation of a plane passing through the line of intersection of the planes $7x - 4y + 7z + 16 = 0$ and $4x + 3y - 2z + 3 = 0$ and is parallel to the plane $3x - 7y + 9z + 5 = 0$.

Problem-14: Find the equation of a plane passing through the line of intersection of the planes $x - 2y + 3z + 4 = 0$ and $2x - 3y + 4z - 1 = 0$ and is perpendicular to the plane $3x - y + 2z - 1 = 0$.

Problem-17: Find the equation of the plane that passes through the point $(2, -3, 1)$ and is normal to the line joining the points $(3, 4, -1)$ and $(2, -1, 5)$.