FAQ's

1. Define a plane and give its equation in general form.

   Answer:

   A plane is a two-dimensional doubly ruled surface spanned by two linearly independent vectors.

   General form of equation is ax+by+cz+d=0

2. Find the angle θ between the planes 4x-8y-z+5=0 and x+2y-2z+3=0

   Answer:

   The angle between two planes is equal to the angle between their normal. The vectors $N_1 = \frac{4i - 8j - k}{9}, N_2 = \frac{i + 2j - 2k}{3}$ are unit vectors normal to the given planes. The dot product yields $\cos\theta = N_1 - N_2 = -\frac{10}{27}$ and θ=112˚.

   The planes intersect, making a pair of angles equal to 112˚ and a second pair equal to 68˚. Choosing the smaller angle, we give the angle between the planes as 68˚.

3. Obtain the equation of the plane which contains. The point (4,-3,2) and is perpendicular to the vector $N = 2\vec{i} - 3\vec{j} + 5\vec{k}$.

   Answer:

   2x-3y+5z+D=0

   For any value of D this equation represents a plane perpendicular to the given vector. The equation will be satisfied by the co-ordinates of the given point if 8+9+10+D=0 or D=-27

   Therefore the required equation is 2x-3y+5z-27=0

4. Give the general equation of a plane passing through a given point, passes through the origin and parallel to co-ordinates axes.

   Answer:

General equation of a plane passing through a point (x_1,y_1,z_1) is given as $a(x-x_1)+b(y-y_1)+c(z-z_1)=0$.

Equation of a plane that passes through the origin is given by $ax+by+cz=0$. Equation of a plane parallel to the co-ordinate axes are given by

I. If $a=0$ then $by+cz+d=0$ is a parallel to x-axis.
II. If $b=0$ then $ax+cz+d=0$ is a plane parallel to y-axis.
III. If $c=0$ then $ax+by+d=0$ is a plane parallel to z-axis.

5. Give the general equation of a line in two different form.

Answer:

Equations of a line can be obtained is symmetrical form and Non-symmetrical form.

In symmetrical form $\frac{x-\alpha}{l}+\frac{y-\beta}{m}+\frac{z-\gamma}{n}=AP$

Where AP is the length of the line In Non-symmetrical form

$a_1x+b_1y+c_1z+d_1=0$

$a_2x+b_2y+c_2z+d_2=0$