Assignment-2

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I. Intersection of Conics(CBSE)

Question: Find the length of the intercept cut off by the plane $2x + y - z = 5$ on the x-axis .

Variable	Description
x	x-coordinate in 3D
y	y-coordinate in 3D
z	z-coordinate in 3D
Plane	$2x + y - z = 5$
Intercept	$\frac{5}{2}, 0, 0$
X-axis	Where $y = 0$ and $z = 0$

Table 1
Variables Used

Solution: To find the length of the intercept cut off by the plane $2x + y - z = 5$ on the x-axis, we need to determine the point where the plane intersects the x-axis.

On the x-axis, the coordinates can be represented as $(x, 0, 0)$. Substituting $y = 0$ and $z = 0$ into the plane equation, we have:

$$2x + 0 - 0 = 5 \tag{1}$$

this simplifies to:

$$2x = 5 \tag{2}$$

solving for x:

$$x = \frac{5}{2} \tag{3}$$

So, the intercept on the x-axis is at the point $\left(\frac{5}{2}, 0, 0\right)$

Thus, the length of the intercept is: length of the intercept = $\frac{5}{2}$.

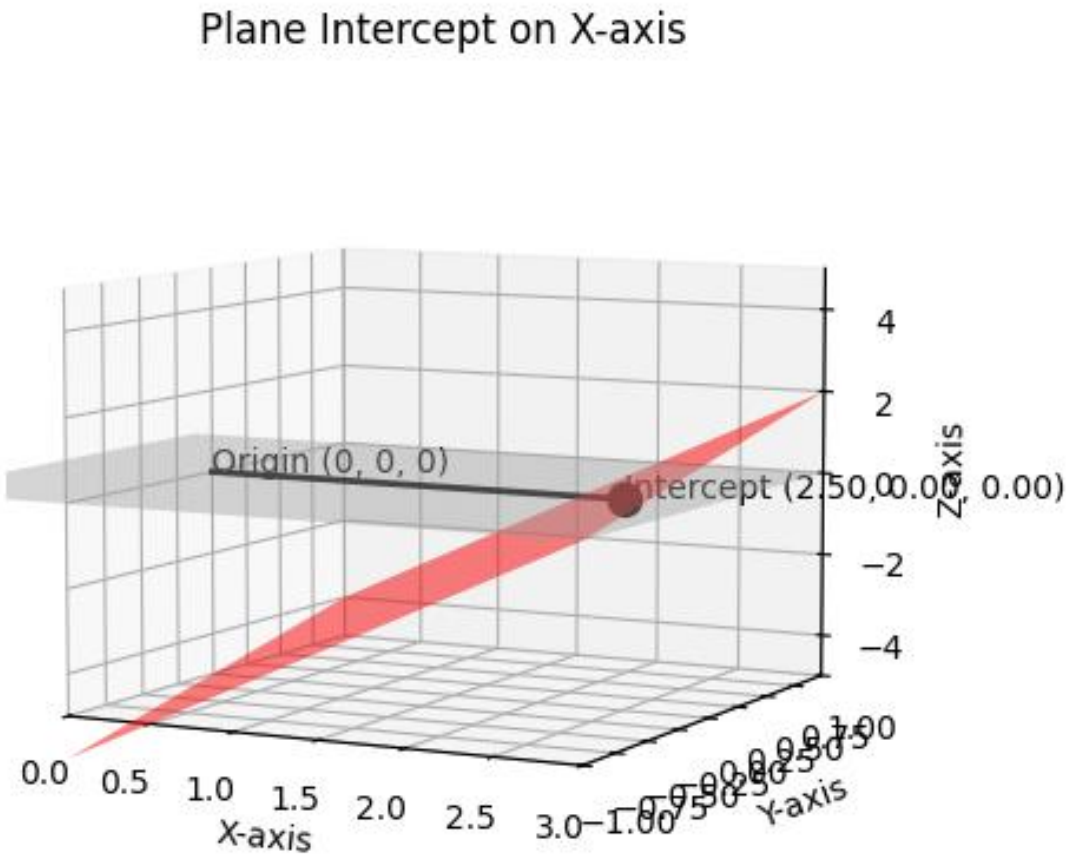

Fig. 1. Stem Plot of y(n)