

# Assignment-2

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## I. VECTOR ARITHMETIC(CBSE)

**Question:**  $(-1, 2, 1)$ ,  $(1, -2, 5)$ ,  $(4, -7, 8)$  and  $(2, -3, 4)$  are the vertices of a parallelogram.

Variable	Value	Description
$A$	$\begin{pmatrix} -1 \\ 2 \\ 1 \end{pmatrix}$	$A$ defined as point
$B$	$\begin{pmatrix} 1 \\ -2 \\ 5 \end{pmatrix}$	$B$ defined as point
$C$	$\begin{pmatrix} 4 \\ -7 \\ 8 \end{pmatrix}$	$C$ defined as point
$D$	$\begin{pmatrix} 2 \\ -3 \\ 4 \end{pmatrix}$	$D$ defined as point

Table 1  
VARIABLES USED

**Solution:** property : opposite sides of parallelogram are equal.

$A(-1, 2, 1)$ ,  $B(1, -2, 5)$ ,  $C(4, -7, 8)$ ,  $D(2, -3, 4)$

$$AB = B - A = (1 - (-1), -2 - 2, 5 - 1) = (2, -4, 4) \quad (1)$$

$$BC = C - B = (4 - 1, -7 - (-2), 8 - 5) = (3, -5, 3) \quad (2)$$

$$CD = D - C = (2 - 4, -3 - (-7), 4 - 8) = (-2, 4, -4) \quad (3)$$

$$DA = A - D = (-1 - 2, 2 - (-3), 1 - 4) = (-3, 5, -3) \quad (4)$$

Verify if  $AB$  is equal to  $CD$  and  $BC$  is equal to  $DA$ :

$$AB + CD = (2, -4, 4) + (-2, 4, -4) = (0, 0, 0) \quad (5)$$

$$BC + DA = (3, -5, 3) + (-3, 5, -3) = (0, 0, 0) \quad (6)$$

Since  $AB + CD = 0$  and  $BC + DA = 0$ , the quadrilateral formed by the points is a parallelogram.

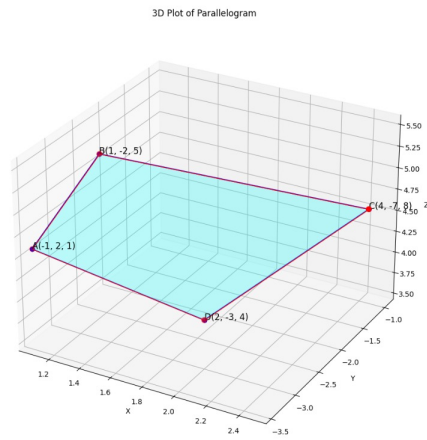


Fig. 1. Stem Plot of  $y(n)$