SM5083
Assignment Number 02

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Chapter III
Exercise-III Q.VII

1) Find the Diagonals of the Parallelogram formed by the lines:
U=0, U=a, V=0, V=b
Solution:

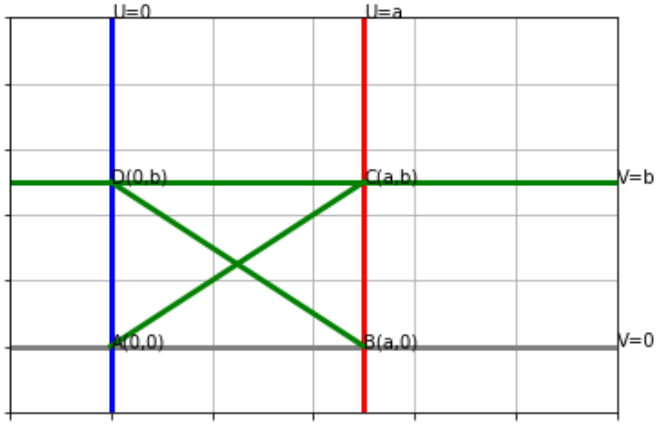

Fig. 1. Parallelogram with vertices

Vertices of parallelogram $A = \begin{pmatrix}0\\0\end{pmatrix}, B = \begin{pmatrix}a\\0\end{pmatrix}, C = \begin{pmatrix}a\\b\end{pmatrix}, D = \begin{pmatrix}0\\b\end{pmatrix}$ (1.1)

slope of AC $= (m_1) = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{b-0}{a-0} = \frac{b}{a}$ (1.2)

slope of BD $= (m_2) = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1} = \frac{b-0}{0-a} = \frac{b}{-a}$ (1.3)

Equation of AC : $y - y_1 = m_1(x - x_1)$ (1.4)

$$y - 0 = \frac{b}{a}(x - 0) \quad (1.5)$$

ay-bx=0 (1.6)

Equation of BD : y-y$_1 = m_2(x - x_1)$

$$y - 0 = \frac{-b}{a}(x - a) \quad (1.7)$$

ay+bx=ab (1.8)

Equation of Diagonal AC: ay-bx=0 (1.9)

Equation of Diagonal BD: ay+bx=ab (1.10)