

$$M = \begin{pmatrix} \begin{matrix} 1 & 2 & 3 \\ 6 & 7 & 8 \\ 11 & 12 & 13 \\ 16 & 17 & 18 \end{matrix} & 4 & 5 \\ 9 & 10 & 14 & 15 \\ 19 & 20 \end{pmatrix} \xrightarrow{\text{Transpose}} M^T = \begin{pmatrix} \begin{matrix} 1 & 6 & 11 \\ 2 & 7 & 12 \\ 3 & 8 & 13 \end{matrix} & 16 \\ 4 & 9 & 14 & 19 \\ 5 & 10 & 15 & 20 \end{pmatrix}$$

The diagram illustrates the transpose operation on a matrix M . The original matrix M is a 5x5 matrix with elements 1 through 20. A 3x3 submatrix (rows 1-3, columns 1-3) is highlighted in pink. A red dashed arrow labeled "Transpose" points to the transposed matrix M^T , which is a 5x5 matrix where the highlighted submatrix is now a 3x3 block in the top-left corner, and the elements are rearranged according to the transpose operation.