

On considère la matrice  $A = \begin{pmatrix} 1 & 2 & 1 & 3 \\ 1 & 0 & 2 & 1 \end{pmatrix}$ .

Calculer  $A^T \times A$  et  $A \times A^T$ .



$$A = \begin{pmatrix} 1 & 2 & 1 & 3 \\ 1 & 0 & 2 & 1 \end{pmatrix} \Rightarrow {}^t A = \begin{pmatrix} 1 & 1 \\ 2 & 0 \\ 1 & 2 \\ 3 & 1 \end{pmatrix}$$

$$({}^t A) \cdot A = \begin{pmatrix} 1 & 1 \\ 2 & 0 \\ 1 & 2 \\ 3 & 1 \end{pmatrix} \begin{pmatrix} 1 & 2 & 1 & 3 \\ 1 & 0 & 2 & 1 \end{pmatrix} = \begin{pmatrix} 2 & 2 & 3 & 4 \\ 2 & 4 & 2 & 6 \\ 3 & 2 & 5 & 5 \\ 4 & 6 & 5 & 10 \end{pmatrix}$$

$$\text{A. } {}^t A = \begin{pmatrix} 1 & 2 & 1 & 3 \\ 1 & 0 & 2 & 1 \end{pmatrix} \begin{pmatrix} 1 & 1 \\ 2 & 0 \\ 1 & 2 \\ 3 & 1 \end{pmatrix} = \begin{pmatrix} 15 & 6 \\ 6 & 6 \end{pmatrix}$$