QUESTION

Given that $\mathbf{C} = \begin{pmatrix} -1 & 2 \\ -2 & 3 \end{pmatrix}$ evaluate $\mathbf{C}\mathbf{C}^T$.

ANSWER

$$\begin{aligned} \mathbf{C}\mathbf{C}^T &= \begin{pmatrix} -1 & 2 \\ -2 & 3 \end{pmatrix} \begin{pmatrix} -1 & -2 \\ 2 & 3 \end{pmatrix} \\ &= \begin{pmatrix} -1(-1)+2(2) & -1(-2)+2(3) \\ -2(-1)+3(2) & -2(-2)+3(3) \end{pmatrix} \\ &= \begin{pmatrix} 1+4 & 2+6 \\ 2+6 & 4+9 \end{pmatrix} \\ &= \begin{pmatrix} 5 & 8 \\ 8 & 13 \end{pmatrix} \end{aligned}$$