Advanced Higher Maths
SQA 2025 Paper 1
Question 4

Advanced Higher Maths
Maths.scot

Matrices A and B are defined by $A=\begin{pmatrix}-3 & 2\\ 0 & 1\end{pmatrix}$ and $B=\begin{pmatrix}2 & 2\\ 5 & \lambda\end{pmatrix}$ where $\lambda \in \mathbb{R}$.

(a) Find $3A+2B$. **1**

(b) (i) Find $A'B$, where A' is the transpose of A. **2**

(ii) Find an expression for the determinant of $A'B$. **1**

(iii) Determine the value of λ such that $A'B$ is singular. **2**

Answers:

(a) $\begin{pmatrix}-5 & 10\\ 10 & 3+2\lambda\end{pmatrix}$

(b) (i) $\begin{pmatrix}-6 & -6\\ 9 & 4+\lambda\end{pmatrix}$

(ii) $-6(4+\lambda)-(-6)(9)$ or $30-6\lambda$

(iii) $\lambda = 5$