Advanced Higher Maths
SQA 2019 Paper
Question 2

Matrix A is defined by

$$A=\begin{pmatrix}2 & 1 & 4\\ -3 & p & 2\\ -1 & -2 & 5\end{pmatrix}$$

where $p \in \mathbb{R}$.

(a) Given that the determinant of A is 3, find the value of p. **3**

Matrix B is defined by

$$B=\begin{pmatrix}0 & 1\\ q & 3\\ 4 & 0\end{pmatrix}$$

where $q \in \mathbb{R}$.

(b) Find AB. **2**

(c) Explain why AB does not have an inverse. **1**

Answers:

(a) -3

(b) $\begin{pmatrix}q+16 & 5\\ -3q+8 & -12\\ -2q+20 & -7\end{pmatrix}$

(c) A has order 3×3 and B has order 3×2, so AB has order 3×2, which isn't a square matrix. Only square matrices can have inverses.