Quiz 7 (Sections 4.2, 4.3)

You will have 30 minutes to complete the quiz.

Name:
Student Number:

Q1 Let A be the following 4×4 matrix.

$$A = \begin{bmatrix} 4 & 18 & 3 & -1 \\ 2 & -5 & 0 & -3 \\ 0 & 1 & 0 & a_{34} \\ 0 & 7 & 0 & a_{44} \end{bmatrix}$$

(a) Compute the determinant of A. (3 Points)

(b) Assume $T : \mathbb{R}^4 \to \mathbb{R}^4$ is a linear transformation induced by the matrix A. For which values a_{34}, a_{44} is the transformation T invertible? (1 Point)

Q2 Let B be a $n \times n$ matrix such that $B^T B = I_n$. Prove that $|\det(B)| = 1$. (2 Points)

Q3 Assume that for some matrix C, we have $\det(C) = k$. Justify the determinant of the following.

(a) The transpose of C. (2 Points)

(b) We swap two rows of C. (2 Points)

(c) We add a scalar multiple of a row of C to a different row of C. (2 Points)

Q1

Q2

Q3