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.

$$A = \begin{bmatrix} 3 & 14 & -1 & -1 \\ 2 & -5 & 0 & -3 \\ 0 & 1 & 0 & a_{34} \\ 0 & -5 & 0 & a_{44} \end{bmatrix}$$

(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_1, B_2 be $n \times n$ matrices that are invertible. Show that $\det(B_1) = \det(B_2 B_1 B_2^{-1})$ (2 Points)

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

(a) The matrix $2C$. (2 Points)

(b) The matrix C^{-1}. (2 Points)

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

Q1

Q2

Q3