Quiz 4

Full mark

Question 1 EXE3 Q14 (5 marks)

For matrix A

Determinant = 0 (0 - 0) – 0 (0 – 0) + 1 (1 – 0)

= 1

For matrix B

Determinant = 0 (0 – 1) – 1 (0 – 1) + 1 (1 - 0)

= -1(-1) + 1(1)

= 1+1

=2

For matrix C

Determinant = 1(1-1) – 1(1-1) + 1(1-1)

= 0

Question 2 EXE3 Q27 (5 marks)

If A isn't a square matrix, then $|\boldsymbol{A}|$ doesn't exist because its size is not n x n, cannot find the determinant of A.

Question 3 EXE3 Q34 (5 marks)

U and V are orthogonal

Therefore $U^T = U^{-1}$ and $V^T = V^{-1}$

$UV(UV)^T = UV(V)^T(U)^T$

$= UIU^T$

$= UU^T$

$= I$

$W = \frac{1}{\sqrt{2}}\begin{bmatrix} U & U \\ V & -V \end{bmatrix}$

$WW^T = I$

$W^T = W^{-1}$

Therefore it is orthogonal.