

Mathematics 1E2 2006–07
HW 10 Due 22/1/07

Name: _____

ID: _____

(1) Answer true or false:

- (i) An elementary matrix must have nonzero determinant.
(ii) If $(AB)^{-1}$ exists, A^{-1} exists.

(iii) $\begin{vmatrix} a & b & c \\ d & e & 0 \\ f & 0 & 0 \end{vmatrix} = cef.$

(2) Answer true or false:

- (i) The product of two upper triangular matrices is **lower** triangular.
(ii) One can **not** have three linearly independent points in two dimensions.
(iii) Say A is 2×2 . Then $\det(2A) = 2 \det(A)$

(3) Assuming B, S are square and compatible and S^{-1} exists, (i) prove $\det(S^{-1}) = 1/\det(S)$ and (ii) $\det(S^{-1}BS) = \det(B)$.

(4) Deduce that $\det(\lambda I - S^{-1}AS) = \det(\lambda I - A)$. (Note: $S^{-1}(\lambda I)S = \lambda I$.)