King Saud University
College of Science
Department of Mathematics

Math 244 1st Quiz
Summer Semester 1437- 1438H
30 Minutes

Name:	MODEL ANSWER	Student No.:

QUESTION 1 (4 marks, 8 minutes)

Evaluate the following determinants by inspection only'

$\begin{vmatrix} 1 & 0 & 0 \\ 2 & -1 & 4 \\ 0 & 1 & -5 \end{vmatrix}$	$\begin{vmatrix} 1 & 0 & 0 \\ 8 & 2 & 0 \\ 4 & 5 & 3 \end{vmatrix}$	$\begin{vmatrix} 2 & 0 & -4 \\ 0 & 0 & 3 \\ 1 & 0 & 3 \end{vmatrix}$	$\begin{vmatrix} 0 & 0 & 1 \\ 0 & 1 & 0 \\ 1 & 0 & 0 \end{vmatrix}$
det.= 1	det.= 6	det.= 0	det.= -1

QUESTION 2 (2 marks, 8 minutes)

Verify the $\det(A) = \det(A^T)$, if $A = \begin{bmatrix} 3 & 6 & -9 \\ 0 & 0 & -2 \\ -2 & 1 & 5 \end{bmatrix}$.

$$\det(A) = -(-2) \begin{vmatrix} 3 & 6 \\ -2 & 1 \end{vmatrix} = 2(3-(-12)) = 30$$

$$A^T = \begin{bmatrix} 3 & 0 & -2 \\ 6 & 0 & 1 \\ -9 & -2 & 5 \end{bmatrix}$$

$$\det(A^T) = -(-2) \begin{vmatrix} 3 & -2 \\ 6 & 1 \end{vmatrix} = 2(3-(-12)) = 30$$

$$\therefore \det A = \det A^T$$

QUESTION 3 (4 marks, 14 minutes)

Given the $\det(A) = 6$, compute the following:

i. $\det(A^{-1}) = \dfrac{1}{\det A} = \dfrac{1}{6}$

ii. $\det((A^T)^2) =$

$$= \det(A^T A^T)$$
$$= \det A^T \cdot \det A^T$$
$$= \det A \cdot \det A$$
$$= 36$$

GOOD LUCK