King Fahd University of Petroleum and Minerals
Department of Mathematics and Statistics
Math 260
Class Test II, Semester II, 2010-2011
Net Time Allowed: 60 minutes

Name:_____

ID:_____ Section:_____ Serial:_____

1. Given that $\begin{bmatrix} m & 2m & 3m \\ rm & r^2 & rf \\ 2f & 6f & 0 \end{bmatrix} A = \begin{bmatrix} 0 & 0 & m \\ 0 & r & 0 \\ f & 0 & 0 \end{bmatrix}$. Find $(A^T)^{-1}$.

2. Without directly solving the following homogeneous system, determine whether it has a nontrivial solution or not: (Show all necessarily work)

$$\begin{aligned} x - 2y + z &= 0 \\ 2x + 3y + z &= 0 \\ 3x + y + 2z &= 0. \end{aligned}$$

3. Use the adjoint method to find the inverse of

$$A = \begin{bmatrix} 1 & a & a^2 \\ 1 & b & b^2 \\ 1 & c & c^2 \end{bmatrix}$$

.

4. Solve each of the following:

(i) Prove or disprove:

$$det(A + B) = det(A) + det(B).$$

(ii) Let A be a 3×3 matrix. If you want to multiply row 1 by 2, row 2 by 3, and row 3 by 4, then multiply on the.....by the matrix.....

(iii) If the 5×5 matrix A has col 3 = 2(col 1)+3(col 2), find a solution of $Ax = 0$.

(iv) Multiply: $\begin{bmatrix} 1 \\ 2 \\ 3 \end{bmatrix} \begin{bmatrix} 4 & 5 & 6 & 7 \end{bmatrix}$.

(v) What is the inverse of the following elementary matrix?

$$A = \begin{bmatrix} 1 & 0 & -3 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$$

. Note: Dont bother with Gauss Jordan elimination. Youll receive no credit for this technique. Think about elementary matrices!