Prince Sultan University
Department of Mathematics and General Sciences

Finite Mathematics
Math 101
Major II
Term 151
Thursday, November 26, 2015

Time Allowed: 80 minutes

Name:
Student Number:
Section:

Jehad 8.00 or Jehad 11.00 / Abid / Muhammad

Statement of Ethics:

I agree to complete this exam without unauthorized assistance from any person, materials, or device.

Signature:

Questions	Q.1,2,3	Q.4,5	Q.6,7	Q.8	Total
Marks	5+5+5	5+12	6+10	12	60
Student's Marks					

Q.1 Over a five-year period, an original principle of 2000$ accumulated to 2950$ in an account in which interest was compounded quarterly. Determine the effective rate of interest.

Q.2 Find the present value of 500$ due after three years at 8.75% compounded quarterly.

Q.3 Find the present value of an annuity of 1500$ per month for 15 months at the rate of 9% compounded monthly.

Q.4 Find x , y and z so that $\begin{bmatrix} x-2 & 3 & 2z \\ 6y & x & 2y \end{bmatrix} = \begin{bmatrix} y & z & 6 \\ 18z & y+2 & 6z \end{bmatrix}$.

Q.5 Let $A = \begin{bmatrix} 1 & 2 \\ 0 & -1 \\ 7 & 0 \end{bmatrix}$, $B = \begin{bmatrix} 1 & 3 \\ 4 & -1 \end{bmatrix}$, $C = \begin{bmatrix} 1 & 2 & -1 \\ 1 & 0 & 2 \end{bmatrix}$. Compute the matrices (if possible):

a) $\left(C - 2A^T\right)^T$.

b) $A + C^T - B$.

c) $2AB^2$.

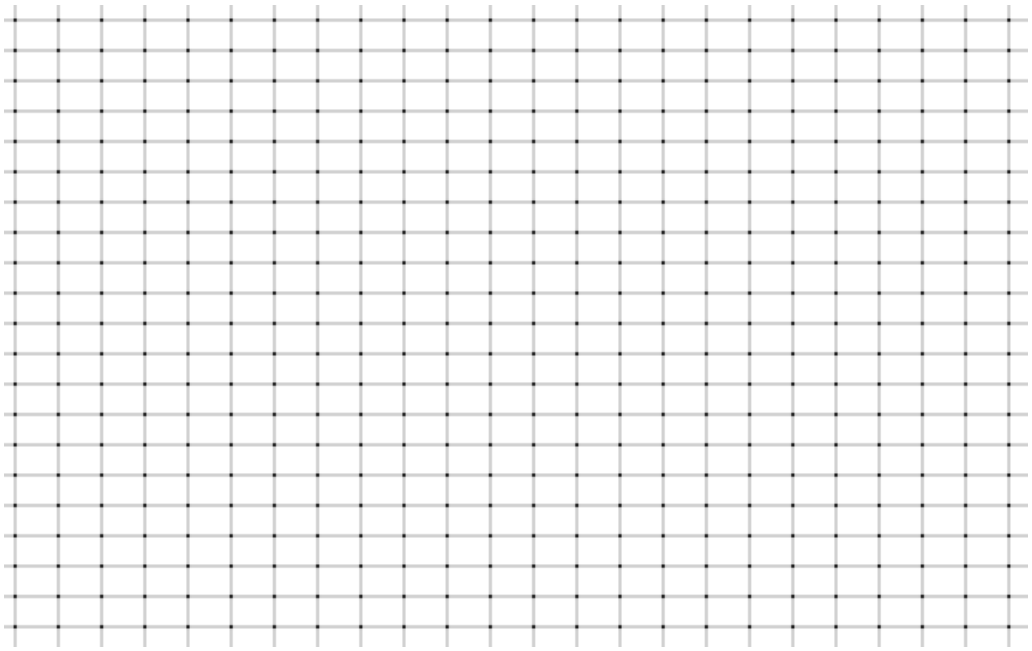
Q.6 Solve the following system $\begin{cases} x-3y+z-5=0 \\ -2x+6y-2z+10=0 \end{cases}$.

Q.7 Solve the following system by using the inverse of the coefficient matrix $\begin{cases} x+3y+2z=2 \\ 2x+7y+3z=1. \\ x+6z=3 \end{cases}$

Q.8 Maximize and minimize the objective function $z = x + 5y$ subject to the constraints

$$\begin{cases} x + 4y \le 12 \\ x \le 8 \\ x + y \ge 2 \\ x \ge 0 \\ y \ge 0 \end{cases}$$

. Identify the feasible region (solution) clearly.



Formula sheet Math 101 (Finite Math)

Simple interest

$I=Prt$ (P is principal, r is percentage rate, and t is the time in years)

Future Value of Simple interest (S)

$$S = P(1+rt)$$

Future value of Compound Interest

$$S = P\left(1+\frac{r}{n}\right)^{nt}$$

Effective Rate (r_e)

$$r_e = \left(1+\frac{r}{n}\right)^{n} - 1$$

Present value of Annuity

$$A = R\frac{1-(1-r)^{-n}}{r}$$

Where A is the present value of ordinary annuity
R is payment
n is the total number of payments
r is percentage interest rate