Quiz # 3

MATH 141 Summer 1 2012 - Dr. Oksana Shatalov

LAST NAME_____ FIRST NAME_____ Section #_____

Due Monday 6/4 at the beginning of class.

- **If turned in later than 10 minutes into class, 5 points off. No papers will be accepted after class.**
- If you turn it in to my office (Blocker 629F), place it in my mailbox (Blocker 603) or e-mail a PDF-version to me, make sure you do it before 9:45am, Monday 6/4/2012.
- You MUST show ALL your work to get full credit. Just writing the answers down is not enough. Even if you use your calculator, write down the preliminary work.
- Your work must be neat, easy to follow. BOX YOUR FINAL ANSWERS.
- You may use notes and textbook, but not the help of anything else.

On my honor, as an Aggie, I certify that the solution submitted by me is my own work. I had neither given nor received unauthorized aid on this work.

Signature: _____

1. The sizes of matrices A, B, C, D are given in the table:

A	B	C	D
44×44	17×17	44×17	17×44

Determine if the following matrices are defined. If yes, find the size, if not, explain why.

(a) BDC

(b) $BC^T C$

(c) $7B + I_7 D$

(d) $A^{-1}C + BDA$

(e) C^{-1}

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(f) $(BD)^T$

(g) $4B + 7A$

(h) $D^T + ACB$

2. Given system of linear equations:

$$\begin{array}{rcl} 4x_2 + x_3 & = & 5 \\ -11x_1 - x_2 & = & x_3 + 2x_4 \\ 4x_2 & = & 17x_3 - 45 \\ 22x_1 - 3x_2 + x_4 & = & 2012 \end{array}$$

Find the matrices A, B, X so that the given system will be equivalent to the matrix equation $AX = B$. For each matrix indicate its size.

3.

$$A = \begin{bmatrix} 6 & 6 \\ 6 & 28 \\ x & -4 \end{bmatrix}, \quad B = \begin{bmatrix} y-1 & 1 & 9 \\ 4 & 5 & 2z+1 \end{bmatrix}, \quad C = \begin{bmatrix} 6 & 3u \\ 0 & 1 \\ -10 & -1 \end{bmatrix}$$

(a) Find

$$2a_{11} + 3b_{21} + c_{32} =$$

(b) Solve for $u, x, y,$ and z in the following matrix equation:

$$A = 6B^T - 2C$$

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4. Justin has three times as many nickels as quarters and three more dimes than nickels. If the total face value of these coins is $2.40, how many coins does Justin have? **Set up the system of equations, but DO NOT SOLVE.** Be sure to clearly define the variables.

5. A brokerage firm packaged blocks of blue-chip stocks, bonds and high-risk stocks into three portfolios, which it offers to its customers. Portfolio I contains 1 block of blue chip stocks, 4 blocks of bonds, and 3 blocks of high-risk stocks. Portfolio II contains 2 blocks of blue-chip stocks, 1 block of bonds, and 2 blocks of high-risk stocks. Portfolio III contains 4 blocks of blue-chip stocks, 2 blocks of bonds, and 1 block of high-risk stocks. A customer wants 8 blocks of blue-chip stocks, 11 blocks of bonds, and 9 blocks of high-risk stocks. Write a system of equations you could use to determine how many of each portfolio should the customer purchase? **Set up the system of equations, but DO NOT SOLVE.** Be sure to clearly define the variables.