Finite Mathematics, Summer 2010, quiz #2, Friday July 16, 2010

1. (a) What is the *Identity Matrix*?

   (b) What is the *inverse* of a matrix?

2. Find $\begin{bmatrix} 2 & 3 & 5 \\ 7 & 9 & 11 \end{bmatrix}^T$

3. How many solutions does this system have? find all of them if there is any:

$$\begin{cases} 2x - 4y - 2z = 6 \\ y + 2x + 4z = 0 \end{cases}$$

4. If $A = \begin{bmatrix} 3 & 5 & 7 \\ 2 & 4 & 6 \\ 1 & 3 & 5 \end{bmatrix}$ and $B = \begin{bmatrix} 0 & 1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, find $A \cdot B$.

5.

$$\begin{cases} 3x + 2y + 1z = 0 \\ 2y + z = 0 \\ z = 0 \end{cases}$$

   (a) Write the matrix of the coefficients of this system of linear equations, and call it A:

   (b) Find A^{-1}.

   (c) verify the matrices that you found in part a and b, are really inverses of each other.

   (d) solve the system using A^{-1}.

6. *(Optional)* If A has an inverse, show that A^{-1} has also an inverse, and $(A^{-1})^{-1} = A$

7. *(Optional)* In problem 4, find $B.A$

8. *(Optional)* In problem 5 find the solution of the system without using matrices.