

MA162: Finite mathematics

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SCHEDULE:

- HW 2.5-2.6 are due Friday, Sep 23rd, 2011.
- Exam 1 is Monday, Sep 26th, 5:00pm-7:00pm in CB106.

Today we will cover the Ch 2 part of the practice exam

Inversion

- Find the inverse of the matrix $P = \begin{bmatrix} 1 & 0 & 0 \\ 3 & 1 & 0 \\ 0 & 3 & 1 \end{bmatrix}$.

- Suppose that $A^{-1} = \begin{bmatrix} -3 & -3 & -1 \\ 3 & 1 & 0 \\ 4 & 3 & 1 \end{bmatrix}$ and $B = \begin{bmatrix} 3 \\ -3 \\ -5 \end{bmatrix}$.

Determine the solution X of the equation $AX = B$.

Setup a word problem

- For the following word problem: (a) Write down variables describing the (numerical) business decision to be made, (b) write down equations that constrain your decision, (c) convert the equations to an augmented matrix. **You need not solve the system.**

Mr. Marjoram runs a stuffed animal factory, and is very worried about paying taxes on his rather large inventory of plush fabric, cloud-like stuffing, and whimsical trim. He decides he is going to use every last bit of his inventory to make the 2011 Marjoram Menagerie! His menagerie only includes Pandas, Saint Bernards, and Onerly Ostriches. Each Panda requires 1.5 square yards of plush, 30 cubic feet of stuffing, and 12 pieces of trim. Each Saint Bernard requires 2 square yards of plush, 35 cubic feet of stuffing, and 8 pieces of trim. Each Onerly Ostrich requires 2.5 square yards of plush, 25 cubic feet of stuffing, and 5 pieces of trim. Marjoram's storage room has 110 square yards of velvety plush, 1400 cubic feet of fluffy stuffing, and 350 pieces of tremendous trim. How many stuffed animals of each type should he make in order to use up all of his inventory?

RREF it

- Here is the augmented matrix of a linear system of equations. Take this matrix to RREF. Be sure to label your reduction operations in standard notation. You need not solve for the variables.

$$\left(\begin{array}{cccc|c} x & y & z & w & \text{RHS} \\ \hline 7 & 6 & 5 & 4 & 3 \\ 0 & 3 & 4 & 5 & 6 \\ 0 & 0 & 1 & 2 & 3 \end{array} \right)$$

Read the answer from RREF

- Here is the augmented matrix of a linear system of equations. As usual, the variables are mentioned for your convenience.

$$\left(\begin{array}{cccc|c} x & y & z & w & \text{RHS} \\ \hline 1 & 2 & 0 & 0 & 3 \\ 0 & 0 & 1 & 0 & 4 \\ 0 & 0 & 0 & 1 & 5 \end{array} \right)$$

Matrix arithmetic

- Consider the following matrices and answer the questions. In each case, either calculate the expression or explain why it is not defined.

$$P = \begin{bmatrix} 5 & 3 & -6 \\ -2 & -6 & -6 \\ -3 & -2 & -1 \end{bmatrix} \quad Q = \begin{bmatrix} 4 & -5 & -4 \\ 5 & 5 & 2 \end{bmatrix}$$

$$L = \begin{bmatrix} -1 & -2 \\ -3 & -6 \\ -3 & 5 \end{bmatrix} \quad M = \begin{bmatrix} 1 & -4 \\ -4 & -2 \end{bmatrix}$$

- $M^2 + M$, QP , LP , $11Q - 5L$, MQ