MA162: Finite mathematics

Jack Schmidt

University of Kentucky

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Schedule:

- HW 2.5-2.6 are due Friday, Sep 21st, 2012.
- Exam 1 is Monday, Sep 24th, 5:00pm-7:00pm in BS107 and BS116.
- Alternate exam (appt. only) Monday, Sep 24th, 3:00pm-5:00pm in CB212.

Today we will review the practice exam, chapter 2 style.

Practice exam: chapter 1.3, 1.4, 1.3, 1.4

1. Producing 15 items costs \$300, but producing 20 items costs \$320. Assuming a linear model of production costs, how much would producing 16 items cost?

2. Where do the lines given by the following equations intersect?
   $x + y = 12$ and $2x + 3y = 31$

7. Panda-money-em specializes in production of panda bear themed financial calculators. The fixed costs of production total to \$1000, while the marginal costs are only \$10 per calculator. If the calculators sell for \$50 per calculator, what is the break-even production and the break-even cost?

9. The data analysts have done a best-linear-model-fit to the data on the suppliers and found that supply X is currently governed by $X = 45P + 100$ as long as the price P remains between \$5 and \$10 per unit. The demand is handled by another department, and they appear to be on vacation. You know that at \$5 per unit, 500 will be demanded, and at \$10 per unit only 100 will be demanded.

Practice exam: chapter 2.4, 2.5

3. Matrix arithmetic. Do the following calculations if possible. If impossible, explain why.

(a) Add $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} + \begin{bmatrix} 10 \\ 20 \\ 30 \end{bmatrix}$

(b) Multiply $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \times \begin{bmatrix} 10 \\ 20 \\ 30 \end{bmatrix}$

(c) Add $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} + \begin{bmatrix} 70 & 80 & 90 \\ 100 & 110 & 120 \end{bmatrix}$

(d) Multiply $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix} \times \begin{bmatrix} 70 & 80 & 90 \\ 100 & 110 & 120 \end{bmatrix}$

Practice exam: chapter 2.2, 2.3, 2.1

4. Write the following equations in matrix form:

$$\begin{aligned} x + y &= z \\ 2x &= y + z \\ 3x + 4y + 5z &= 30 \end{aligned}$$

5/6. A system of equations is represented by the matrix (blah)

(a) Write out the system of equations

(b) Solve it: $x =$ _____, $y =$ _____, $z =$ _____

(5)

$$\left[\begin{array}{ccc|c} x & y & z & RHS \\ \hline 1 & 0 & 0 & 3 \\ 0 & 1 & 0 & 4 \\ 0 & 0 & 1 & 5 \end{array}\right]$$

(6)

$$\left[\begin{array}{ccc|c} x & y & z & RHS \\ \hline 1 & 1 & 0 & 3 \\ 0 & 0 & 1 & 5 \end{array}\right]$$

Practice exam: Chapter 2.5

8. Hill Street Oooze specializes in the production of food like products from various chemical substances. It has 4 main ingredients: Red, Green, White, and Pulsing oozes. It has 3 main products: Mutant Mango, Neon Nectarine, and OMG Orange. Additionally it has two main dispenser machines: the Front Machine and the Side Machine. Describe how much of each ingredient is used at each of the machines given the following ingredients list and sales records.

	Ingredients per order				**Sales record**		
	Red	Green	White	Pulsing	Front	Side	
MM	6 oz	0 oz	1 oz	1 oz	100 orders	60 orders	MM
NN	4 oz	2 oz	0 oz	2 oz	200 orders	50 orders	NN
OO	3 oz	1 oz	1 oz	3 oz	300 orders	40 orders	OO

Practice exam: Chapter 2.2

10. Before recent adjustments to accounting practices, departments were required to spend all the money on each budget line each fiscal year. At the end of one year, the department discovered it had about $1000 in each of three budget lines: Labor, Materials, and Storage. It had three ongoing projects: the Old project, the New project, and the previously Forgotten project. Each project spends a certain amount of each budget per day, and the department needs to tell each project how many days of work it needs to do before the year is up.

	Resource usage per day			Remaining
	Old	New	Forgotten	Budget
Labor	$9	$18	$27	$1035
Materials	$8	$17	$28	$1005
Storage	$9	$18	$28	$1050

- Give a full and complete solution!