

EXAM 3 - MATH 111

Wednesday, November 6, 2002

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Read each problem very carefully before starting to solve it. Each question is worth 2 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. Linda owes \$10,000 to a furniture store. She has agreed to pay the amount in 6 months at an interest rate of 10%. 3 months before the loan is due, the store needs \$12,000 to pay a wholesaler's bill. The bank agrees to discount the note at a rate of 12%. How much of the \$12,000 owed will be taken care of?
2. George deposits \$5,000 at the beginning of each semiannual period for 5 years in an account paying 10% compounded semiannually. After this period, he leaves the money alone with no further deposits for an additional 5 years. Find the final amount in the account at the end of the entire 10 year period.
3. Solve the following system **by substitution** $\begin{cases} 2x + y = -1 \\ -5x + 2y = 16 \end{cases}$
4. Solve the following system **by the Gauss-Jordan method**

$$\begin{cases} x + y + z = -1 \\ -x + 3y - z = 1 \\ 2x + y - 2z = 6 \end{cases}.$$

5. Let $X = \begin{bmatrix} x & 0 \\ 0 & y \end{bmatrix}$. Solve the matrix equation $X^2 = 2X + \begin{bmatrix} -1 & 0 \\ 0 & 3 \end{bmatrix}$.

6. Find the inverse of the matrix $A = \begin{bmatrix} 1 & 0 & -1 \\ 0 & 1 & 0 \\ 2 & 1 & 1 \end{bmatrix}$.