# PRACTICE EXAM 4 - MATH 111

DATE: Friday, April 8

INSTRUCTOR: George Voutsadakis

Read each problem very carefully before starting to solve it. Each question is worth 3 points. It is necessary to show your work. Correct answers without explanations are worth 0 points.

GOOD LUCK!!

1. A winemaker has two large casks of wine. One wine is 8% alcohol and the other is 18% alcohol. How many gallons of each wine should be mixed to produce 30 gallons of wine that is 12% alcohol?

2. Use the Gauss-Jordan method to solve the linear system

$$\left\{\begin{array}{rcrcrcl} x & + & y & + & z & = & 6 \\ 2x & - & y & - & z & = & 0 \\ -x & + & 3y & + & 2z & = & 5 \end{array}\right\}$$

3. Solve the matrix equation $5X - 2B = 7A$, where

$$A = \begin{bmatrix} 2 & -1 & 5 \\ -3 & 2 & 7 \end{bmatrix} \quad \text{and} \quad B = \begin{bmatrix} 2 & -3 & -2 \\ 7 & -5 & 1 \end{bmatrix}.$$

4. Find the inverse matrix of $A = \begin{bmatrix} 2 & 0 & 4 \\ 1 & -1 & 0 \\ 0 & 1 & -2 \end{bmatrix}$.

5. Tickets to a band concert cost \$2 for children, \$3 for teenagers and \$5 for adults. 570 people attended the concert and the total ticket receipts were \$1950. Three fourths as many teenagers as children attended. How many children, teenagers and adults were at the concert?

6. Joel George is a section chief for an electronics firm. The employees in his section assemble computers, install the software and test the final products. Joel found that of the 103 employees in his section 45 can assemble computers, 50 can install software, 57 can test final products, 28 can assemble computers and install software, 20 can install software and test the final products, 25 can assemble computers and test the final products and 11 can do all three jobs. Fins how many employees in his section cannot do any of the three jobs.