Math 270 HW#11

Name:_____ Date:_____

Show your work very clearly, neatly, and box your final answer.

One Side Only

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1. Use Cramer's Rule to solve $\begin{cases} 2x_1 & -x_2 & = -10 \\ 3x_1 & +2x_2 & = -1 \end{cases}$

2. An equation of the line passing through the distinct points (x_1, y_1) and (x_2, y_2) is given by $\det\begin{bmatrix} x & y & 1 \\ x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \end{bmatrix} = 0$, use this method to find an equation of the line that contains the points $(-4, 7)$ and $(2, 7)$.

3. The area of the triangle whose vertices are (x_1, y_1), (x_2, y_2), and (x_3, y_3) is given by $\text{Area} = \pm\frac{1}{2}\det\begin{bmatrix} x_1 & y_1 & 1 \\ x_2 & y_2 & 1 \\ x_3 & y_3 & 1 \end{bmatrix}$ where the sign $\pm$ is chosen to obtain a positive area. Use this method to find the area of a triangle whose vertices are $(4,0)$, $(-4,0)$, and $(0,6)$.

4.Use mathematical induction to prove if λ is an eigenvalue of matrix A, then λ^m is an eigenvalue of A^m.

5. True or False:

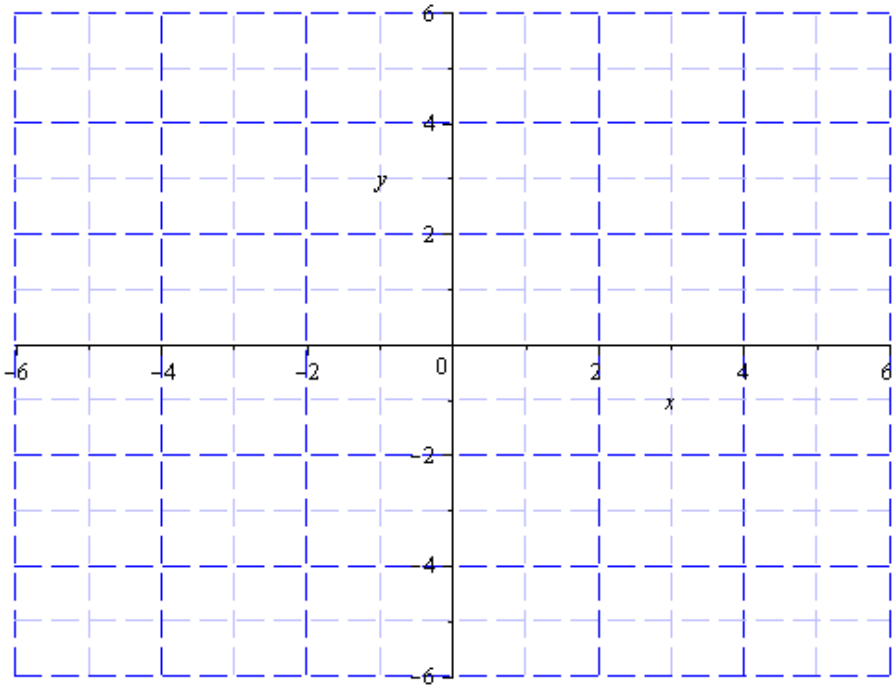
a. If two columns of an $n \times n$ matrix A are identical, then $\lambda = 0$ is an eigenvalue of A.

Ans._____

b. If 16 is an eigenvalue of A^2, then 4 is an eigenvalue of A.

Ans._____

6. Given: $u = (4,1)$ and $v = (-1,4)$, draw u, v, $u + v$ and $u - v$ in standard form.



7. Describe the zero vector and the additive inverse of a vector in the vector space $M_{2,3}$ under standard operation of matrices.

8. Given: $u = (0,1,4)$, $v = (-1,1,2)$, and $w = (3,1,2)$

Use Cramer's Rule to find one of the scalars a, b, or c such that $(-1,-2,-2) = au + bv + cw$.