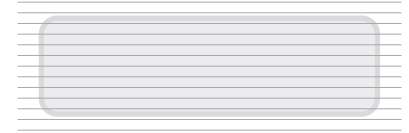




Test 1

Name _____ Uni _____



[1] Find the determinant of the matrix

$$A = \begin{bmatrix} 1 & 1 & 5 & 1 & 1 \\ 1 & 1 & 1 & 1 & 1 \\ 0 & 3 & 0 & 0 & 0 \\ 1 & 1 & 1 & 3 & 1 \\ 1 & 1 & 1 & 1 & 4 \end{bmatrix}$$

$\det(A) =$



Test 1

[2] Find the inverse to the matrix

$$A = \begin{bmatrix} 2 & 3 & 4 \\ 3 & 2 & 1 \\ 1 & 1 & 0 \end{bmatrix}$$

$$A^{-1} = \frac{1}{\square} \begin{bmatrix} \square & \square & \square \\ \square & \square & \square \\ \square & \square & \square \end{bmatrix}$$



Test 1

[3] Using Cramer's rule, solve for y in the system of equations

$$\begin{bmatrix} a & 1 & 2 \\ b & 1 & 1 \\ c & 1 & 4 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} = \begin{bmatrix} 1 \\ 1 \\ 5 \end{bmatrix}$$

$$y = \frac{(\quad) a + (\quad) b + (\quad) c}{(\quad) a + (\quad) b + (\quad) c}$$



Test 1

[5] Let $f(n)$ be the determinant of the $n \times n$ matrix in the sequence

$$\begin{bmatrix} \end{bmatrix} \quad \begin{bmatrix} 4 \end{bmatrix} \quad \begin{bmatrix} 4 & 1 \\ 3 & 4 \end{bmatrix} \quad \begin{bmatrix} 4 & 1 & 0 \\ 3 & 4 & 1 \\ 0 & 3 & 4 \end{bmatrix} \quad \begin{bmatrix} 4 & 1 & 0 & 0 \\ 3 & 4 & 1 & 0 \\ 0 & 3 & 4 & 1 \\ 0 & 0 & 3 & 4 \end{bmatrix} \quad \begin{bmatrix} 4 & 1 & 0 & 0 & 0 \\ 3 & 4 & 1 & 0 & 0 \\ 0 & 3 & 4 & 1 & 0 \\ 0 & 0 & 3 & 4 & 1 \\ 0 & 0 & 0 & 3 & 4 \end{bmatrix}$$

Find a recurrence relation for $f(n)$. Express $f(n)$ using a matrix power. Find a formula for $f(n)$.

$$f(n) = (\square) f(n-1) + (\square) f(n-2)$$
$$\begin{bmatrix} f(n) \\ f(n+1) \end{bmatrix} = \begin{bmatrix} \square & \square \\ \square & \square \end{bmatrix}^n \begin{bmatrix} f(0) \\ f(1) \end{bmatrix}$$

$f(n) =$