Honors Trig/Pre-Calculus **Matrices—No Calculator!!** **Name:**

No work necessary for #1

←See notes from yesterday

1. Write a 2 x 2 identity matrix and a 3 x 3 identity matrix.

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2. Let $M = \begin{bmatrix} 1 & -3 \\ 2 & 0 \end{bmatrix}$ $N = \begin{bmatrix} -6 & 3 \\ 8 & 20 \end{bmatrix}$

See notes for 2x2 inverse

Solve the following using the given matrices. ***Show all steps!***

a. M^2 b. det M c. M^{-1} d. $M^{-1}M$ e. det N f. N^{-1}

$M \cdot M$

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

determinant

$= 1(0) - 2(-3)$

$= \boxed{6}$

2. Let $M=\begin{bmatrix}1 & -3\\ 2 & 0\end{bmatrix}$ $N=\begin{bmatrix}-6 & 3\\ 8 & 20\end{bmatrix}$

Show all work!

Solve the following using the given matrices:

a. M^2 b. det M c. M^{-1} d. $M^{-1}M$ e. det N f. N^{-1} g. NN^{-1}

h. Find matrix X such that: $N + X = 2M$ i. Solve for X: $5X - M = N$

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3. Let $A=\begin{bmatrix}1 & 3 & 2\\ -1 & 2 & -1\\ 2 & -2 & 3\end{bmatrix}$ $B=\begin{bmatrix}2 & -3 & 2\\ 1 & 0 & -1\\ 4 & 5 & 3\end{bmatrix}$ $C=\begin{bmatrix}2\\ 3\\ -1\end{bmatrix}$

Solve the following using the given matrices:

a. AC b. B^2 c. CB d. BC e. BB^{-1} f. $A^{-1}A$ g. det A

d. $M^{-1} \cdot M$

$$\begin{bmatrix}0 & \frac{1}{2}\\ -\frac{1}{3} & \frac{1}{6}\end{bmatrix} \cdot \begin{bmatrix}1 & -3\\ 2 & 0\end{bmatrix}$$

Do not show work...just write the answer!

or $\frac{1}{6}\begin{bmatrix}0 & 3\\ -2 & 1\end{bmatrix} \cdot \begin{bmatrix}1 & -3\\ 2 & 0\end{bmatrix}$

multiply matrices, then distribute fraction

Matrix sheet hints for #4-6:

Clearly show all steps for #4-6.

4. A 2 x 2 matrix is defined as $T = \begin{bmatrix} x & 2 \\ 3 & y \end{bmatrix}$. Find the values of x and y if $T^2 = \begin{bmatrix} 7 & 16 \\ 24 & 87 \end{bmatrix}$.

Solve for T^2, then set equal to, + solve for x and y

$$\begin{bmatrix} x & 2 \\ 3 & y \end{bmatrix} \cdot \begin{bmatrix} x & 2 \\ 3 & y \end{bmatrix} = \begin{bmatrix} x^2+6 & \\ & \end{bmatrix}$$

5. Let $P = \begin{bmatrix} 1 & 4 \\ -2 & 3 \end{bmatrix}$ and $O = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$. Given that $P^2 - 4P + kI = O$, find k. ***NOTE: I = identity matrix***

$$\begin{bmatrix} & \\ & \end{bmatrix}^2 - 4\begin{bmatrix} & \\ & \end{bmatrix} + k\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix} = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$$

substitute

6. Let $R = \begin{bmatrix} -1 & 7 \\ 6 & -2 \end{bmatrix}$ and $O = \begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$. Given that $R^2 + 3R + kI = O$, find k.

Similar to #5