Precalculus Practice A.REI.C.9: Matrices
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NAME:_____

1. Which is the inverse of $\begin{bmatrix} -3 & 5 \\ 2 & -4 \end{bmatrix}$?

[A] $\begin{bmatrix} -2 & \frac{5}{2} \\ 1 & \frac{3}{2} \end{bmatrix}$ [B] $\begin{bmatrix} -\frac{1}{3} & \frac{1}{5} \\ \frac{1}{2} & -\frac{1}{4} \end{bmatrix}$

[C] $\begin{bmatrix} 3 & -5 \\ -2 & 4 \end{bmatrix}$ [D] $\begin{bmatrix} -2 & -\frac{5}{2} \\ -1 & -\frac{3}{2} \end{bmatrix}$

[E] $\begin{bmatrix} -\frac{3}{2} & \frac{5}{2} \\ 1 & -2 \end{bmatrix}$

2. Find the inverse of the matrix (if it exists) $\begin{bmatrix} -5 & 4 \\ -4 & -3 \end{bmatrix}$.

[A] $\begin{bmatrix} -3 & -4 \\ 4 & -5 \end{bmatrix}$ [B] $\begin{bmatrix} -\frac{5}{31} & \frac{4}{31} \\ -\frac{4}{31} & -\frac{3}{31} \end{bmatrix}$

[C] $A^{-1}$ does not exist.

[D] $\begin{bmatrix} -\frac{3}{31} & -\frac{4}{31} \\ \frac{4}{31} & -\frac{5}{31} \end{bmatrix}$

3. Find the inverse of the matrix, if it exists. $\begin{bmatrix} -5 & 7 \\ -9 & 4 \end{bmatrix}$

4. Find the inverse of both $A = \begin{bmatrix} 1 & 1 \\ 2 & -1 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 2 \\ 3 & 4 \end{bmatrix}$ to determine $A^{-1} - B^{-1}$.

[A] $\begin{bmatrix} \frac{7}{3} & -\frac{2}{3} \\ -\frac{5}{6} & \frac{1}{6} \end{bmatrix}$ [B] $\begin{bmatrix} \frac{7}{3} & \frac{2}{3} \\ -\frac{13}{6} & \frac{11}{6} \end{bmatrix}$

[C] $\begin{bmatrix} \frac{1}{3} & \frac{2}{3} \\ 0 & -\frac{5}{6} \end{bmatrix}$ [D] $\begin{bmatrix} -\frac{5}{3} & \frac{2}{3} \\ -\frac{11}{6} & \frac{1}{6} \end{bmatrix}$

5. Find the inverse of both $A = \begin{bmatrix} 1 & -4 \\ 2 & 2 \end{bmatrix}$ and $B = \begin{bmatrix} 1 & 4 \\ 3 & -3 \end{bmatrix}$ to determine $A^{-1} - B^{-1}$.

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6. Find the inverse of the matrix $\begin{bmatrix} 1 & 0 & 1 \\ 1 & 1 & -3 \\ 0 & 1 & -3 \end{bmatrix}$.

[A] $\begin{bmatrix} 0 & 1 & -1 \\ 3 & -3 & -3 \\ 1 & -1 & 1 \end{bmatrix}$

[B] $\begin{bmatrix} 0 & 1 & -1 \\ 3 & -3 & 4 \\ 1 & -1 & 1 \end{bmatrix}$

[C] $\begin{bmatrix} 0 & 1 & -1 \\ -3 & 3 & -2 \\ 1 & 1 & 1 \end{bmatrix}$

[D] $\begin{bmatrix} 0 & 1 & -1 \\ -3 & 3 & -2 \\ -1 & 1 & -1 \end{bmatrix}$

7. Find the inverse of the following matrix, if it exists: $\begin{bmatrix} 1 & 1 & -1 \\ -2 & -3 & 4 \\ 3 & 1 & 2 \end{bmatrix}$

[A] The matrix has no inverse.

[B] $-\begin{bmatrix} -10 & -3 & 1 \\ 16 & 5 & -2 \\ 7 & 2 & -1 \end{bmatrix}$

[C] $-\begin{bmatrix} -10 & 3 & 1 \\ 16 & -3 & -2 \\ 7 & -2 & -1 \end{bmatrix}$

[D] $-\begin{bmatrix} 10 & -3 & 2 \\ 16 & 5 & -2 \\ 7 & -2 & -1 \end{bmatrix}$

8. Find the inverse of the following matrix, if it exists: $\begin{bmatrix} 1 & 2 & 2 \\ -2 & -5 & -4 \\ 0 & 0 & 1 \end{bmatrix}$

9. Find the inverse of the following matrix, if it exists: $\begin{bmatrix} 1 & -3 & -1 \\ -2 & 5 & 4 \\ 3 & -10 & -4 \end{bmatrix}$

10. Compare the quantity in Column A and the quantity in Column B.

$A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$ $B = \begin{bmatrix} e & f \\ g & h \end{bmatrix}$

*A* does *not* have an inverse. *B* has an inverse.

| Column A | Column B |
|---|---|
| $ad - bc$ | $eh - fg$ |

[A] The quantity in Column A is greater.

[B] The quantity in Column B is greater.

[C] The two quantities are equal.

[D] The relationship cannot be determined on the basis of the information supplied.

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[1] D

[2] D

[3] $\frac{1}{43}\begin{bmatrix} 4 & -7 \\ 9 & -5 \end{bmatrix}$

[4] A

[5] $\begin{bmatrix} 0 & \frac{2}{15} \\ -\frac{2}{5} & \frac{1}{6} \end{bmatrix}$

[6] B

[7] B

[8] $\begin{bmatrix} 5 & 2 & -2 \\ -2 & -1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

[9] $\frac{1}{3}\begin{bmatrix} 20 & -2 & -7 \\ 4 & -1 & -2 \\ 5 & 1 & -1 \end{bmatrix}$

[10] D