Find the inverse of the matrix: $\begin{pmatrix} 1/4 & -3/4 \\ -1/2 & 1/2 \end{pmatrix}$

Tries 0/3

Find the inverse matrix using an augmented matrix.

$$A = \left[\begin{array}{cc|cc} -10 & -14 & 1 & 0 \\ -12 & -3 & 0 & 1 \end{array}\right]$$

Note: Partial credit is given for each correct column. A column will be colored green only if *ALL* entries in that column are correct. That is, some of the entries in a red column may be correct.
(Do not swap any rows. Enter the components of the matrix as exact values in the form of a simplified fraction.)
1. Transform Row 1 first, and then use Row 1 to get a 0 for the second row, first column entry. 1 0

Tries 0/3

2. Transform Row 2 first, and then use Row 2 to get a 0 for the first row, second column entry. 1 0

Tries 0/3

The inverse of the matrix:

Tries 0/3

Find the inverse of the matrix: $\begin{pmatrix} 0 & -1 & -1 \\ -4 & 0 & -5 \\ 0 & 3 & 1 \end{pmatrix}$

Tries 0/3

Find the inverse using an augmented matrix.

$$A = \left[\begin{array}{ccc|ccc} 2 & 0 & 4 & 1 & 0 & 0 \\ 4 & 4 & -3 & 0 & 1 & 0 \\ -5 & -6 & 1 & 0 & 0 & 1 \end{array}\right]$$

Note: Partial credit is given for each correct column. A column will be colored green only if *ALL* entries in that column are correct. That is, some of the entries in a red column may be correct.
(Do not swap any rows. Enter the components of the matrix as exact values in the form of a simplified fraction.)
1. Transform Row 1 first, and then use Row 1 to get a 0 for the second row, first column entry and a 0 for the third row, first column entry. 1 0 0

Tries 0/3

2. Transform Row 2 first, and then use Row 2 to get a 0 in the first row, second column entry and in the third row, second column entry.

1 0 0 0 1 0

Tries 0/3

3. Transform Row 3 first, and then use Row 3 to get a 0 for the first row, third column entry and a 0 for the second row, third column entry.

1 0 0 0 1 0 0 0 1

Tries 0/3

The inverse of the matrix is:

Tries 0/3

The inverse of the matrix

$$B = \begin{bmatrix} -5/42 & -1/14 & -1/42 \\ 3/28 & -1/28 & 1/14 \\ 1/84 & 3/28 & 5/42 \end{bmatrix}$$

is

$$B^{-1} = \begin{bmatrix} -6 & 3 & -3 \\ -6 & -7 & 3 \\ 6 & 6 & 6 \end{bmatrix}.$$

Given the related system of equations,

$$\begin{aligned} -\tfrac{5}{42}x - \tfrac{1}{14}y - \tfrac{1}{42}z &= -11 \\ \tfrac{3}{28}x - \tfrac{1}{28}y + \tfrac{1}{14}z &= 3 \\ \tfrac{1}{84}x + \tfrac{3}{28}y + \tfrac{5}{42}z &= 9, \end{aligned}$$

find the value of y.

Tries 0/3

The inverse of the matrix

$$B = \begin{bmatrix} 1 & \frac{2}{5} \\ -1 & -\frac{1}{5} \end{bmatrix}$$

is

$$B^{-1} = \begin{bmatrix} -1 & -2 \\ 5 & 5 \end{bmatrix}.$$

Given the related system of equations,

$$x + \frac{2}{5}y = -3$$

$$-x - \frac{1}{5}y = -9$$

find the values of x and y.
$x =$ ☐ , $y =$ ☐
Tries 0/3

Use the system of equations below to answer the following questions.

$$x + 4y = 29$$
$$5x + 3y = -8$$

Find the inverse of the coefficient matrix.
(Enter the components of the matrix as exact values in the form of simplified fractions.)

☐ ☐
☐ ☐

Solve the system of equations by finding the values for x and y.
(Enter your answers as exact values in the form of a simplified fractions.)

(x,y)=(☐, ☐)

Tries 0/3

Find the inverse of the matrix: $\begin{pmatrix} 2 & 0 & 3 \\ -3 & 0 & -4 \\ 4 & 5 & 0 \end{pmatrix}$

(Round your answers to four decimal places).

Note: Partial credit is given for each correct column. A column will be colored green only if *ALL* entries in that column are correct. That is, some of the entries in a red column may be correct.

☐ ☐ ☐ ☐ ☐ ☐
☐ ☐ ☐

Tries 0/3

Solve the system of equations by first finding and then using the inverse of the coefficient matrix.

$$-2x + z = 1$$
$$2x - y + 3z = 42$$
$$-3x + 2y - 4z = -62$$

Note: Partial credit is given for each correct column. A column will be colored green only if *ALL* entries in that column are correct. That is, some of the entries in a red column may be correct.
(Enter the components of the matrix as exact values in the form of a simplified fraction.)

Tries 0/3

$(x, y, z) = (\ \square\ ,\ \square\ ,\ \square\ )$

Tries 0/3

Solve the system of equations by using the inverse of the coefficient matrix.

$$\begin{aligned} 2x &- z &= -1 \\ -2x + y - 3z &= -39 \\ 3x - 2y + 4z &= 56 \end{aligned}$$

$(x, y, z) = (\ \square\ ,\ \square\ ,\ \square\ )$

Tries 0/3

Find the determinant of the matrix

$$A = \begin{bmatrix} 9 & -3 \\ -7 & -4 \end{bmatrix}.$$

$\det(A) = \square$

Tries 0/3

Which of the following 2×2 matrices is singular?
NOTE: ONLY 3 ANSWER TRIES ON THIS PROBLEM.

A. $\begin{bmatrix} -1 & 6 \\ 2 & -6 \end{bmatrix}$

B. $\begin{bmatrix} -4 & 5 \\ 6 & -7 \end{bmatrix}$

C. $\begin{bmatrix} 9 & -5 \\ -9 & 5 \end{bmatrix}$

D. $\begin{bmatrix} -9 & -10 \\ 4 & 9 \end{bmatrix}$

E. $\begin{bmatrix} -9 & 4 \\ -6 & -2 \end{bmatrix}$

Tries 0/3

Find the minors M_{ij} and cofactors C_{ij} for the second row of the matrix A.

$$\begin{bmatrix} 9 & -3 & -7 \\ -4 & 4 & 1 \\ -9 & 7 & 9 \end{bmatrix}$$

$M_{21} =$ ☐ , $C_{21} =$ ☐ , $M_{22} =$ ☐ , $C_{22} =$ ☐ , $M_{23} =$ ☐ , $C_{23} =$ ☐

Tries 0/3

Find the cofactors C_{ij} for the first row of the matrix A, and then find the determinant.

$$\begin{bmatrix} 1 & -2 & -1 \\ -7 & -4 & 7 \\ 3 & 4 & -3 \end{bmatrix}$$

$C_{11} =$ ☐ , $C_{12} =$ ☐ , $C_{13} =$ ☐

Tries 0/3

$\det(A) =$ ☐

Tries 0/3

Find the cofactors C_{ij} for the second column of the matrix A, and then find the determinant.

$$\begin{bmatrix} -2 & -2 & 4 \\ 2 & -5 & -4 \\ 7 & 1 & -4 \end{bmatrix}$$

$C_{12} =$ ☐ , $C_{22} =$ ☐ , $C_{32} =$ ☐

Tries 0/3

$\det(A) =$ ☐

Tries 0/3

Let $C = \begin{pmatrix} -5 & -1 & -2 \\ -5 & 4 & -2 \\ 3 & -4 & -2 \end{pmatrix}$. Compute $\det(C)$.

☐

Tries 0/3

Solve for x.

$$\begin{vmatrix} x+3 & 1 \\ 2 & x+2 \end{vmatrix} = 0$$

$x =$ ☐ ☐

Tries 0/3

Solve for x.

$$\begin{vmatrix} x-6 & 0 & -2 \\ -9 & x+4 & 1 \\ -9 & -2 & x-5 \end{vmatrix} = 0$$

$x =$ ☐ ☐ ☐

Tries 0/3

Find the **eigenvalues** for the matrix

$$A = \begin{bmatrix} -1 & -2 \\ 1 & -4 \end{bmatrix}.$$

☐ ☐

Tries 0/3

Find all the eigenvalues of the matrix

$$\begin{bmatrix} 0 & -8 \\ 1 & -6 \end{bmatrix}$$

.

☐ ☐

Tries 0/3

Which of the following are eigenvectors of the matrix $\begin{bmatrix} 0 & 2 \\ -1 & 3 \end{bmatrix}$?
NOTE: ONLY 3 ANSWER TRIES ON THIS PROBLEM.

Choices: **True**, **False**.

- $\begin{bmatrix} 2 \\ 1 \end{bmatrix}$
- $\begin{bmatrix} 4 \\ 3 \end{bmatrix}$

- $\begin{bmatrix} 6 \\ 5 \end{bmatrix}$
- $\begin{bmatrix} -1 \\ -1 \end{bmatrix}$

Tries 0/3

Which of the following are eigenvectors of the matrix $\begin{bmatrix} -5 & 3 \\ -12 & 8 \end{bmatrix}$?
NOTE: ONLY 3 ANSWER TRIES ON THIS PROBLEM.

Choices: **True**, **False**.

- $\begin{bmatrix} 1 \\ 3 \end{bmatrix}$
- $\begin{bmatrix} -7 \\ -2 \end{bmatrix}$
- $\begin{bmatrix} 5 \\ 7 \end{bmatrix}$
- $\begin{bmatrix} 3 \\ 4 \end{bmatrix}$

Tries 0/3

Find the **eigenvalues** for the matrix

$$A = \begin{bmatrix} 1 & -2 \\ 1 & 4 \end{bmatrix}.$$

(Enter the smallest eigenvalue in the left answer box.)

Tries 0/3

Find the **eigenvalues** and corresponding **eigenvectors** for the matrix $\begin{bmatrix} 0 & 5 \\ -6 & 11 \end{bmatrix}$.

$\lambda_1 =$ $\quad v_1 =$

Tries 0/3

$\lambda_2 =$ ☐ $v_2 =$ ☐

Tries 0/3

Find the **eigenvalues** and corresponding **eigenvectors** for the matrix $\begin{bmatrix} 1 & \frac{1}{4} \\ -\frac{7}{4} & -1 \end{bmatrix}$.

$\lambda_1 =$ ☐ $v_1 =$ ☐

Tries 0/3

$\lambda_2 =$ ☐ $v_2 =$ ☐

Tries 0/3

Find the **eigenvalues** and corresponding **eigenvectors** for the matrix

$$A = \begin{bmatrix} 10 & 5 \\ 2 & 1 \end{bmatrix}.$$

$\lambda_1 =$ ☐ $v_1 =$ ☐

Tries 0/3

$\lambda_2 =$ ☐ $v_2 =$ ☐

Tries 0/3

Find the **eigenvalues** for the matrix

$$\begin{bmatrix} -13 & 4 & 10 \\ -11 & 2 & 10 \\ -7 & 2 & 6 \end{bmatrix}$$

(Answer from the smallest eigenvalue)

☐ ☐ ☐

Tries 0/3

The matrix

$$A = \begin{bmatrix} -13 & 12 & 2 \\ -8 & 7 & 2 \\ -16 & 12 & 5 \end{bmatrix}$$

has $r = -5$ as one of its **eigenvalues**. Which of the following is an **eigenvector** associated to this matrix and eigenvalue?
NOTE: ONLY 2 ANSWER TRIES ON THIS PROBLEM.

A. $\begin{bmatrix} 2 \\ 2 \\ 1 \end{bmatrix}$

B. $\begin{bmatrix} 1 \\ 3 \\ 2 \end{bmatrix}$

C. $\begin{bmatrix} 2 \\ 1 \\ 2 \end{bmatrix}$

D. $\begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}$

Tries 0/3

The matrix

$$A = \begin{bmatrix} -25 & 12 & 16 \\ -26 & 13 & 16 \\ -14 & 6 & 11 \end{bmatrix}$$

has $r = -5$ as one of its **eigenvalues**. Which of the following is an **eigenvector** associated to this matrix and eigenvalue?
NOTE: ONLY 2 ANSWER TRIES ON THIS PROBLEM.

A. $\begin{bmatrix} 1 \\ 0 \\ 1 \end{bmatrix}$

B. $\begin{bmatrix} 1 \\ 3 \\ 2 \end{bmatrix}$

C. $\begin{bmatrix} 2 \\ 2 \\ 1 \end{bmatrix}$

D. $\begin{bmatrix} 2 \\ 1 \\ 1 \end{bmatrix}$

Tries 0/3

Find the **eigenvalues** for the matrix

$$\begin{bmatrix} -25 & 12 & 16 \\ -26 & 13 & 16 \\ -14 & 6 & 11 \end{bmatrix}$$

Tries 0/3

Find the **eigenvalues** and corresponding **eigenvectors** for the matrix $\begin{bmatrix} 3 & 5 & 3 \\ 0 & -9 & 18 \\ 0 & -2 & 4 \end{bmatrix}$.

$\lambda_1 =$ $\quad v_1 =$

Tries 0/3

$\lambda_2 =$ ☐ $v_2 =$ ☐

Tries 0/3

$\lambda_3 =$ ☐ $v_2 =$ ☐

Tries 0/3

Find the **eigenvalues** and corresponding **eigenvectors** for the matrix $\begin{bmatrix} -1 & -2 & 4 \\ -3 & 0 & 4 \\ -3 & 3 & 1 \end{bmatrix}$.

$\lambda_1 =$ ☐ $v_1 =$ ☐

Tries 0/3

$\lambda_2 =$ ☐ $v_2 =$ ☐

Tries 0/3

$\lambda_3 =$ ☐ $v_3 =$ ☐

Tries 0/3
