1. (1 point) Are the following matrices invertible?

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

? 2. $\begin{bmatrix} 30 & -5 \\ 0 & 0 \end{bmatrix}$

? 3. $\begin{bmatrix} -6 & -5 \\ 30 & 25 \end{bmatrix}$

? 4. $\begin{bmatrix} -1 & -4 \\ 5 & -4 \end{bmatrix}$

Correct Answers:

- INVERTIBLE
- NOT INVERTIBLE
- NOT INVERTIBLE
- INVERTIBLE

2. (1 point) If

$$A = \begin{bmatrix} -2 & 0 \\ 0 & 7 \end{bmatrix},$$

then

$A^{-1} = \begin{bmatrix} \_\_ & \_\_ \\ \_\_ & \_\_ \end{bmatrix}$.

Correct Answers:

- $\begin{bmatrix} -0.5 & 0 \\ 0 & 0.142857 \end{bmatrix}$

3. (1 point) Are the following matrices invertible?

? 1. $\begin{bmatrix} 1 & 6 & 3 \\ 0 & -2 & 4 \\ -1 & -12 & 9 \end{bmatrix}$

? 2. $\begin{bmatrix} 1 & 4 & -5 \\ 0 & 0 & -2 \\ -1 & 5 & 3 \end{bmatrix}$

Correct Answers:

- NOT INVERTIBLE
- INVERTIBLE

4. (1 point) If

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

then

$A^{-1} = \begin{bmatrix} \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \end{bmatrix}$.

Correct Answers:

- $\begin{bmatrix} -0.333333 & 0 & 0 \\ 0 & 0.25 & 0 \\ 0 & 0 & -0.5 \end{bmatrix}$

5. (1 point) If

$$A = \begin{bmatrix} 4 & 4 & 9 \\ 0 & -6 & 9 \\ 0 & 0 & -1 \end{bmatrix},$$

then

$A^{-1} = \begin{bmatrix} \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \end{bmatrix}$.

Correct Answers:

- $\begin{bmatrix} 0.25 & 0.166667 & 3.75 \\ 0 & -0.166667 & -1.5 \\ 0 & 0 & -1 \end{bmatrix}$

6. (1 point) If

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

then

$A^{-1} = \begin{bmatrix} \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \\ \_\_ & \_\_ & \_\_ \end{bmatrix}$.

Correct Answers:

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

7. (1 point) If

$$A = \begin{bmatrix} -5 & 2 \\ 7 & -1 \end{bmatrix},$$

then

$A^{-1} = \begin{bmatrix} \_\_ & \_\_ \\ \_\_ & \_\_ \end{bmatrix}$.

Given $\vec{b} = \begin{bmatrix} 1 \\ 1 \end{bmatrix}$, solve $A\vec{x} = \vec{b}$.

$\vec{x} = \begin{bmatrix} \_\_ \\ \_\_ \end{bmatrix}$.

Correct Answers:

- $\begin{bmatrix} 0.111111 & 0.222222 \\ 0.777778 & 0.555556 \end{bmatrix}$
- $\begin{bmatrix} 0.333333 \\ 1.33333 \end{bmatrix}$

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8. (1 point) If

$$A = \begin{bmatrix} 5 & -10 & -21 \\ 1 & -1 & -1 \\ 1 & -2 & -4 \end{bmatrix},$$

then

$A^{-1} = \begin{bmatrix} \_\_\_ & \_\_\_ & \_\_\_ \\ \_\_\_ & \_\_\_ & \_\_\_ \\ \_\_\_ & \_\_\_ & \_\_\_ \end{bmatrix}$.

Given $\vec{b} = \begin{bmatrix} 0 \\ 5 \\ -1 \end{bmatrix}$, solve $A\vec{x} = \vec{b}$.

$\vec{x} = \begin{bmatrix} \_\_\_ \\ \_\_\_ \\ \_\_\_ \end{bmatrix}$.

Correct Answers:

- $\begin{bmatrix} 2 & 2 & -11 \\ 3 & 1 & -16 \\ -1 & 0 & 5 \end{bmatrix}$
- $\begin{bmatrix} 21 \\ 21 \\ -5 \end{bmatrix}$

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9. (1 point) The matrix $\begin{bmatrix} 6 & 7 \\ -9 & k \end{bmatrix}$ is invertible if and only if $k \neq$ ___.

Correct Answers:

- `7*-9/6`