Student: Huseyin Kerem Mican **Instructor:** Taylan Sengul **Assignment:** Section 3.3 Homework
Date: 7/1/21 **Course:** Linear Algebra

1. Use Cramer's rule to compute the solutions of the system.

$7x_1 + 7x_2 = 0$

$4x_1 + 8x_2 = -16$

What is the solution of the system?

$x_1 =$ 4

$x_2 =$ -4

2. Use Cramer's rule to compute the solution of the system.

$$\begin{aligned} x_1 + x_2 &= 2 \\ 5x_1 + 2x_3 &= 0 \\ x_2 - 2x_3 &= 3 \end{aligned}$$

$x_1 =$ $\frac{1}{4}$; $x_2 =$ $\frac{7}{4}$; $x_3 =$ $-\frac{5}{8}$

(Type integers or simplified fractions.)

3. Determine the values of the parameter s for which the system has a unique solution, and describe the solution.

$$\begin{aligned} 5sx_1 + 4x_2 &= 5 \\ 8x_1 + 4sx_2 &= -2 \end{aligned}$$

Choose the correct answer below.

- **A.** $s \neq \pm 2\sqrt{\frac{2}{5}}$; $x_1 = \frac{5s+2}{5s^2-8}$; $x_2 = \frac{5(-s-4)}{2(5s^2-8)}$
- **B.** $s \neq \pm 2\sqrt{\frac{2}{5}}$; $x_1 = \frac{5(-s-4)}{2(5s^2-8)}$; $x_2 = \frac{5s+2}{5s^2-8}$
- **C.** $s \neq 0$; $x_1 = \frac{5s+2}{5s^2-8}$; $x_2 = \frac{5(-s-4)}{2(5s^2-8)}$
- **D.** $s \neq 0$; $x_1 = \frac{5(-s-4)}{2(5s^2-8)}$; $x_2 = \frac{5s+2}{5s^2-8}$

4. Compute the adjugate of the given matrix, and then use the Inverse Formula to give the inverse of the matrix.

$$A = \begin{bmatrix} 0 & -5 & -1 \\ 6 & 0 & 0 \\ -2 & 1 & 1 \end{bmatrix}$$

The adjugate of the given matrix is $\text{adj } A = \begin{bmatrix} 0 & 4 & 0 \\ -6 & -2 & -6 \\ 6 & 10 & 30 \end{bmatrix}$.

The inverse of the given matrix is $A^{-1} = \begin{bmatrix} 0 & \frac{1}{6} & 0 \\ -\frac{1}{4} & -\frac{1}{12} & -\frac{1}{4} \\ \frac{1}{4} & \frac{5}{12} & \frac{5}{4} \end{bmatrix}$

(Simplify your answers.)

5. Find the area of the parallelogram whose vertices are listed.

$(-1,0), (0,6), (7,-4), (8,2)$

The area of the parallelogram is 52 square units.

6. Find the volume of the parallelepiped with one vertex at the origin and adjacent vertices at $(4,0,-5)$, $(1,2,5)$, and $(8,2,0)$.

The volume of the parallelepiped is 30 . (Type an integer or a decimal.)