Name: Solutions

Consider the following linear system.

$$\begin{cases} 3x_1 + 2x_2 = 1 \\ 2x_1 - 3x_2 = 5 \end{cases}$$

1. Write the system as a matrix equation $A\mathbf{x} = \mathbf{b}$.

$$\begin{pmatrix} 3 & 2 \\ 2 & -3 \end{pmatrix} \begin{pmatrix} x_1 \\ x_2 \end{pmatrix} = \begin{pmatrix} 1 \\ 5 \end{pmatrix}$$

2. Write $\mathbf{b}$ as a linear combination of the column vectors $\mathbf{a}_1$ and $\mathbf{a}_2$.

$$\begin{pmatrix} 1 \\ 5 \end{pmatrix} = 1 \cdot \begin{pmatrix} 3 \\ 2 \end{pmatrix} - 1 \cdot \begin{pmatrix} 2 \\ -3 \end{pmatrix}$$