

Let

$$A = \begin{bmatrix} -5 & -7 & -4 \\ -6 & 1 & 3 \end{bmatrix}.$$

Define the linear transformation $T : \mathbb{R}^3 \rightarrow \mathbb{R}^2$ by $T(\vec{x}) = A\vec{x}$. Find the images of

$$\vec{u} = \begin{bmatrix} 2 \\ -3 \\ 1 \end{bmatrix} \quad \text{and} \quad \vec{v} = \begin{bmatrix} a \\ b \\ c \end{bmatrix}$$

under T .

$$T(\vec{u}) = \begin{bmatrix} \boxed{} \\ \boxed{} \end{bmatrix}$$

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$$T(\vec{u}) = \begin{bmatrix} \boxed{7} \\ \boxed{-12} \end{bmatrix}$$

$$T(\vec{v}) = \begin{bmatrix} \boxed{-5a - 7b - 4c} \\ \boxed{-6a + b + 3c} \end{bmatrix}$$