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$$M = \begin{bmatrix} -3 & 2 \\ 6 & -2 \end{bmatrix} \qquad \det M = (-3 \times -2) - (2 \times 6)$$
$$= 6 - 12$$
$$= \boxed{-6}$$

$$M^{-1} = \frac{1}{-6} \begin{bmatrix} -2 & -2 \\ -6 & -3 \end{bmatrix} = \begin{bmatrix} \frac{1}{3} & \frac{1}{3} \\ 1 & \frac{1}{2} \end{bmatrix}$$

CROSS PRODUCT

$$\begin{bmatrix} 2 \\ 4 \\ 6 \end{bmatrix} \times \begin{bmatrix} 1 \\ 3 \\ 5 \end{bmatrix} = \begin{bmatrix} 4 \times 5 - 6 \times 3 \\ 6 \times 1 - 2 \times 5 \\ 2 \times 3 - 4 \times 1 \end{bmatrix} = \begin{bmatrix} 20 - 18 \\ 6 - 10 \\ 6 - 4 \end{bmatrix} = \begin{bmatrix} 2 \\ -4 \\ 2 \end{bmatrix}$$