

Determinant 3x3 short cut way

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$$A = \begin{bmatrix} 2 & -3 & 1 \\ 5 & -1 & 2 \\ 3 & 2 & -1 \end{bmatrix}$$

$$(2 \times -1 \times -1) + (-3 \times 5 \times 2) + (1 \times 5 \times 2)$$

$$- (-3 \times 5 \times -1) +$$

$$(2 \times 2 \times 2) + (1 \times -1 \times 3)$$

$$\begin{aligned}
 &= (2 + (-18)) + 10 - \\
 &\quad (15 + 8 + -3) \\
 &= -6 - (-20) \\
 &= \boxed{-26}
 \end{aligned}$$