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Multiplication by Vector

$$\begin{bmatrix} 5 & 4 & 3 & 2 \\ 9 & 7 & 6 & 5 \\ 3 & 9 & 12 & 15 \\ 22 & 18 & 16 & 10 \end{bmatrix} \times \begin{bmatrix} 7 \\ 11 \\ 10 \\ 23 \end{bmatrix}$$

$$\begin{aligned} & (5 \times 7) + (4 \times 11) + (3 \times 10) + (2 \times 23) \\ & (9 \times 7) + (7 \times 11) + (6 \times 10) + (5 \times 23) \\ & (3 \times 7) + (9 \times 11) + (12 \times 10) + (15 \times 23) \\ & (22 \times 7) + (18 \times 11) + (16 \times 10) + (10 \times 23) \end{aligned}$$

$$\begin{aligned} 35 + 44 + 30 + 46 &= 155 \\ 63 + 77 + 60 + 115 &= 315 \\ 21 + 99 + 120 + 345 &= 585 \\ 154 + 198 + 160 + 230 &= 742 \end{aligned}$$

$$\begin{bmatrix} 5 & 4 & 3 & 2 \\ 9 & 7 & 6 & 5 \\ 3 & 9 & 12 & 15 \\ 22 & 18 & 16 & 10 \end{bmatrix} \times \begin{bmatrix} 7 \\ 11 \\ 10 \\ 23 \end{bmatrix} = \begin{bmatrix} 155 \\ 315 \\ 585 \\ 742 \end{bmatrix}$$