

$$\begin{array}{c} \text{Red arrow down} \end{array} \left| \begin{array}{ccc} A11 & A12 & A13 \\ A21 & A22 & A23 \end{array} \right| \cdot \begin{array}{c} \text{Green arrow right} \\ \text{Blue arrow down} \end{array} \left| \begin{array}{c} A11 \\ A21 \\ A31 \end{array} \right| = \begin{array}{c} \text{Red arrow down} \end{array} \left| \begin{array}{c} A11 \\ A21 \end{array} \right| \begin{array}{c} \text{Green arrow right} \end{array}$$

$$= \begin{bmatrix} 2 & \times & 3 \end{bmatrix} * \begin{bmatrix} 3 & \times & 1 \end{bmatrix} \\
 = \begin{bmatrix} 2 & \times & 1 \end{bmatrix}$$