

$$\begin{aligned}
 \vec{v}_1 \times \vec{v}_2 &= \begin{pmatrix} x_1 \\ y_1 \\ z_1 \end{pmatrix} \times \begin{pmatrix} x_2 \\ y_2 \\ z_2 \end{pmatrix} = \begin{pmatrix} y_1 z_2 - z_1 y_2 \\ z_1 x_2 - x_1 z_2 \\ x_1 y_2 - y_1 x_2 \end{pmatrix}
 \end{aligned}$$

Diagram illustrating the cross product of two vectors \vec{v}_1 and \vec{v}_2 . The resulting vector is shown in blue, pointing upwards. The components of the resulting vector are shown in a blue box: $y_1 z_2 - z_1 y_2$, $z_1 x_2 - x_1 z_2$, and $x_1 y_2 - y_1 x_2$.

Diagram illustrating the cross product of two vectors \vec{v}_1 and \vec{v}_2 . The resulting vector is shown in blue, pointing upwards. The components of the resulting vector are shown in a red box: $y_1 z_2 - z_1 y_2$, $z_1 x_2 - x_1 z_2$, and $x_1 y_2 - y_1 x_2$.