Cross Product of Two Vectors Matrix

As shown below, the determinant of the matrix can be used to derive the formula for the cross product of two vectors.

$$A = pi + qj + rk$$
$$B = xi + yj + zk$$

$$A \times B = \begin{vmatrix} i & j & k \\ p & q & r \\ x & y & z \end{vmatrix}$$
$$A \times B = (qz - ry)i - (pz - rx)j + (py - qx)k$$
$$= (qz - ry)i + (rx - pz)j + (py - qx)k$$

Cross Product of Two Vectors Formula

$$A \times B = \|A\| \, \|B\| \sin\theta n$$

$\|A\|$ = length of vector A

$\|B\|$ = length of vector B

θ = angle between A and B

n = unit vector perpendicular to the plane containing a and b