

Cross Product

$$\begin{array}{ccc} \text{L} & \text{J} & \text{K} \\ a_x & a_y & a_z \\ b_x & b_y & b_z \end{array}$$

$$\begin{array}{ccc} -10 & 0 & 27 \\ \text{L} & \text{J} & \text{K} \\ 3 & -5 & 0 \\ 2 & 1 & 9 \end{array} \begin{array}{c} 3 \\ -5 \\ 1 \end{array}$$

$$\begin{array}{ccc} 3 & 45 & 0 \end{array}$$

$$(3 + 45 + 0) - (-10 + 0 + 27) = 31$$

$$\begin{array}{ccc} \text{L} & \text{J} & \text{K} \\ 3(a_x) & -5(a_y) & 0(a_z) \\ 2(b_x) & 1(b_y) & 9(b_z) \end{array}$$

$$\begin{aligned} (a_y b_z - a_z b_y) &= \text{L} \\ (-5)(9) - (0)(1) &= -45 \end{aligned}$$

$$\begin{aligned} + (a_z b_x - a_x b_z) &= \text{J} \\ (0)(2) - (3)(9) &= -27 \end{aligned}$$

$$\begin{aligned} + (a_x b_y - a_y b_x) &= \text{K} \\ (3)(1) - (-5)(2) &= 13 \end{aligned}$$

$$(3, -5, 0) \times (2, 1, 9) = (-45, -27, 13)$$