$$= v_1 i + v_2 j + v_3 k$$

Note: Notice that: (in $\mathbb{R}^3$)

$$\|\vec{i}\| = \sqrt{1^2+0^2+0^2} = \sqrt{1} = 1$$

$$\|\vec{j}\| = \sqrt{0^2+1^2+0^2} = \sqrt{1} = 1$$

$$\|\vec{k}\| = \sqrt{0^2+0^2+1^2} = \sqrt{1} = 1$$

$\vec{i}$, $\vec{j}$ & $\vec{k}$ are unit vectors.

$$\vec{i}\cdot\vec{j} = \vec{j}\cdot\vec{i} = 0$$

$$(1,0,0)\cdot(0,1,0) = 0+0+0 = 0$$

$$(0,1,0)\cdot(1,0,0) = 0+0+0 = 0$$

by Theorem^2 $\cos\theta = \dfrac{\vec{i}\cdot\vec{j}}{\|\vec{i}\|\,\|\vec{j}\|}$

$$= \frac{0}{(1)(1)} = \frac{0}{1} = 0$$

$$\therefore \theta = \cos^{-1}(0) = \frac{\pi}{2} = 90^\circ$$

$$\therefore \vec{i} \perp \vec{j} \ \& \ \vec{j} \perp \vec{i}$$