



$$V = abc$$

$$= (a\mathbf{i} \times b\mathbf{j}) \cdot c\mathbf{k} = abc(\mathbf{i} \times \mathbf{j}) \cdot \mathbf{k} = abc\mathbf{k} \cdot \mathbf{k}$$

$$V = \begin{vmatrix} a & 0 & 0 \\ 0 & b & 0 \\ 0 & 0 & c \end{vmatrix}$$