



$$\mathbf{u} \cdot \mathbf{v} = (a_1 \cdot b_1) + (a_2 \cdot b_2) + \dots + (a_{12288} \cdot b_{12288})$$

$$\|\mathbf{u}\| \times \|\mathbf{v}\| = \sqrt{a_1^2 + a_2^2 + \dots + a_{12288}^2} \times \sqrt{b_1^2 + b_2^2 + \dots + b_{12288}^2}$$