

$$\mathbf{q} \cdot \mathbf{p} = \left( \mathbf{z}_q \cdot \mathbf{s}_p + \mathbf{z}_p \cdot \mathbf{s}_q + \mathbf{z}_p \times \mathbf{z}_q, \mathbf{s}_p \cdot \mathbf{s}_q - \mathbf{z}_p \cdot \mathbf{z}_q \right)$$