

# Properties of Derivatives of Vector Functions



**If  $u$  and  $v$  are differentiable vector functions,  $k$  is a scalar, and  $f$  is a real-valued function, then,**

$$1. \quad (\vec{u} + \vec{v})' = \vec{u}' + \vec{v}'$$

$$2. \quad (k\vec{u})' = k(\vec{u}')$$

$$3. \quad (f\vec{u})' = f(\vec{u}') + (f')\vec{u}$$

$$4. \quad (\vec{u} \cdot \vec{v})' = \vec{u} \cdot \vec{v}' + \vec{v} \cdot \vec{u}'$$

$$5. \quad (\vec{u} \times \vec{v})' = \vec{u} \times \vec{v}' + \vec{u}' \times \vec{v}$$