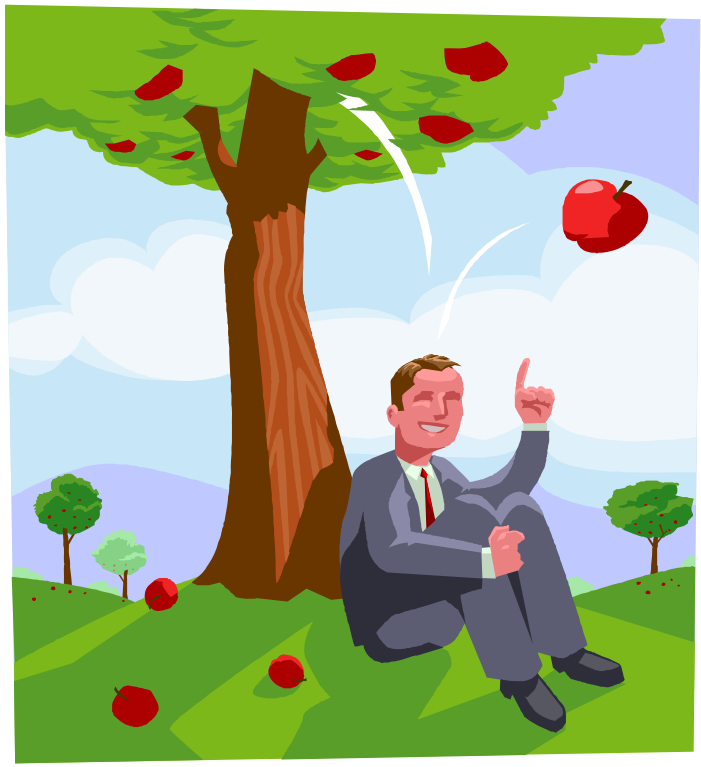
Properties of Derivatives of Vector Functions



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

1. $\left(\vec{u}+\vec{v}\right)' = \vec{u}' + \vec{v}'$
2. $\left(k\vec{u}\right)' = k(\vec{u}')$
3. $\left(f\vec{u}\right)' = f(\vec{u}') + (f')\vec{u}$
4. $(\vec{u}\cdot\vec{v})' = \vec{u}\cdot\vec{v}' + \vec{v}\cdot\vec{u}'$
5. $\left(\vec{u}\times\vec{v}\right)' = \vec{u}\times\vec{v}' + \vec{u}'\times\vec{v}$
6. $\left(\vec{u}(f)\right)' = f'\left(\vec{u}'(f)\right)$