

# PROPERTIES OF VECTORS



If  $a$ ,  $b$ , and  $c$  are vectors and  $c$  and  $d$  are scalars, then:

$$1. \quad \vec{a} + \vec{b} = \vec{b} + \vec{a}$$

$$2. \quad \vec{a} + (\vec{b} + \vec{c}) = (\vec{a} + \vec{b}) + \vec{c}$$

$$3. \quad \vec{a} + \vec{0} = \vec{a}$$

$$4. \quad \vec{a} + (-\vec{a}) = \vec{0}$$

$$5. \quad c(\vec{a} + \vec{b}) = c\vec{a} + c\vec{b}$$

$$6. \quad (c + d)\vec{a} = c\vec{a} + d\vec{a}$$

$$7. \quad (cd)\vec{a} = c(d\vec{a})$$

$$8. \quad 1 \cdot \vec{a} = \vec{a}$$

$$9. \quad 0 \cdot \vec{a} = \vec{0}$$

$$10. \quad \vec{a} + (-1)\vec{b} = \vec{a} - \vec{b}$$