

## Properties of the Dot Product

Let  $\vec{u}$ ,  $\vec{v}$ , and  $\vec{w}$  be vectors, and let  $c$  be a scalar.

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|------|---|-----------------------|
| i.   | $\vec{u} \cdot \vec{v} = \vec{v} \cdot \vec{u}$                                     | Commutative Property  |
| ii.  | $\vec{u} \cdot (\vec{v} + \vec{w}) = \vec{u} \cdot \vec{v} + \vec{u} \cdot \vec{w}$ | Distributive Property |
| iii. | $c(\vec{u} \cdot \vec{v}) = (c\vec{u}) \cdot \vec{v} = \vec{u} \cdot (c\vec{v})$    | Associative Property  |
| iv.  | $\vec{v} \cdot \vec{v} =   \vec{v}  ^2$   | Property of Magnitude |