

CONCEPT: INTRO TO DOT PRODUCT (SCALAR PRODUCT)

- Multiplying **Vectors** by **Scalars** is simple. You'll need to know 2 different ways to multiply **Vectors** by other Vectors:

1) Dot Product (Scalar Product): _____

2) Cross Product (Vector Product): _____ (covered later)

Multiples of Vectors

Vector * Scalar (#) = Vector (number + direction)

$$\left\{ \begin{array}{c} 4 \\ \rightarrow \end{array} \right\} \text{ times } \left\{ \begin{array}{c} 3 \\ \end{array} \right\} = \begin{array}{c} \rightarrow \rightarrow \rightarrow \end{array}$$

Dot Product

Vector • Vector = Scalar (number only, no direction)

$$\left\{ \begin{array}{c} 4 \\ \rightarrow \end{array} \right\} \bullet \left\{ \begin{array}{c} 3 \\ \rightarrow \end{array} \right\} =$$

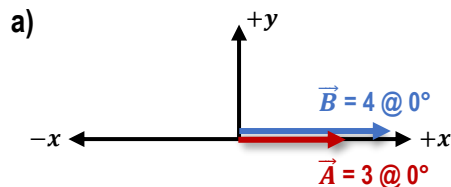
$$\vec{A} \bullet \vec{B} = \underline{\hspace{2cm}}$$

- θ = smallest angle from $\vec{A}$ to $\vec{B}$

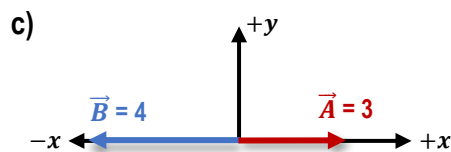
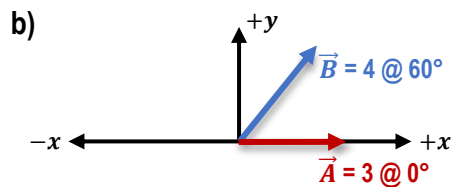
- Put calculator in **degrees** mode!

- Dot Product = multiplication of _____ components.

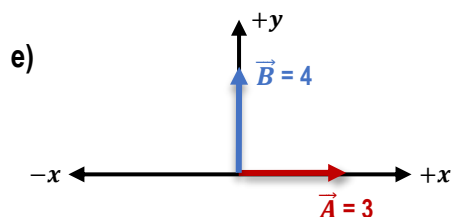
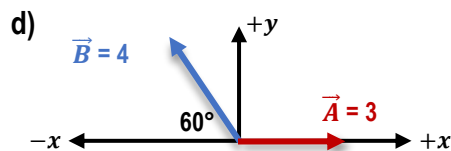
EXAMPLE: Calculate the Dot Product of $\vec{A}$ and $\vec{B}$ in each of the following:



- Always line up vectors **end-to-end** (tail-to-tail)



- Negative Dot Product = components in _____ directions.



- ZERO Dot Product = components in _____ directions.

PRACTICE: Using the vectors given in the figure, (a) find $\vec{A} \bullet \vec{B}$. (b) Find $\vec{A} \bullet \vec{C}$.

