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)

{ 4 → } **times** { 3 } = →→→

Dot Product

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

{ 4 → } • { 3 → } =

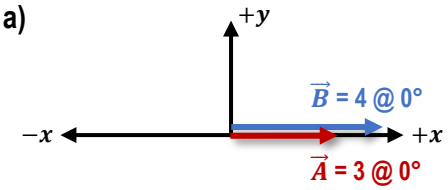
$\vec{A} \bullet \vec{B} =$ _____

- θ = smallest angle from $\vec{A}$ to $\vec{B}$
- Put calculator in **degrees** mode!

- Dot Product = multiplication of _____ components.

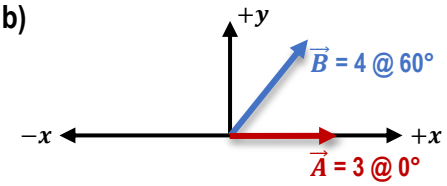
EXAMPLE: Calculate the Dot Product of $\vec{A}$ and $\vec{B}$ in each of the following:

a)

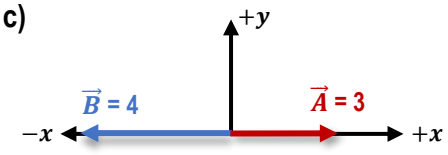


- *Always* line up vectors **end-to-end** (tail-to-tail)

b)

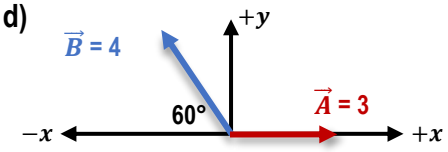


c)

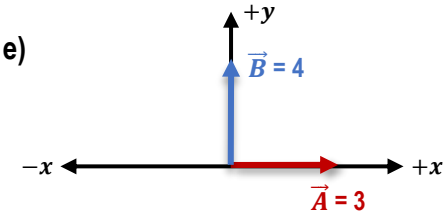


- *Negative* Dot Product = components in _____ directions.

d)



e)



- *ZERO* Dot Product = components in _____ directions.

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