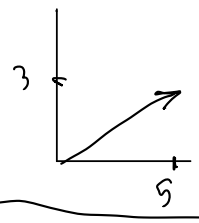
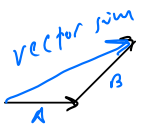
drawing a vector as arrow in space.

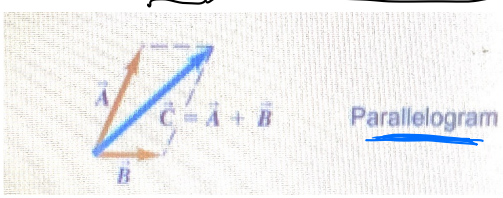
Length of arrow = magnitude
orientation = direction



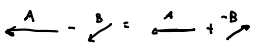
By plotting @ origin of coordinate system, we can do numerical work with it

Head - tail method





Subtracting Vectors



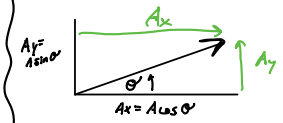
* Add the negative vector

Scalar multiplications

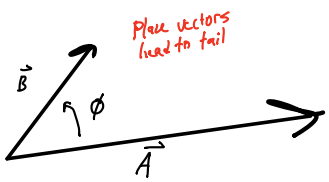
$\vec{A}$ =

$2\vec{A}$ =

$-3\vec{A}$ =



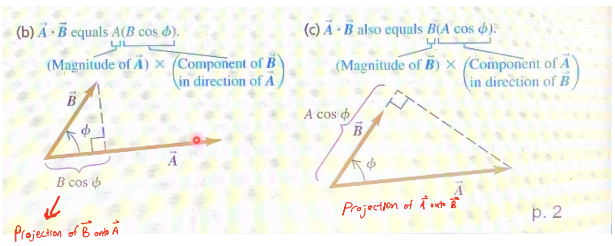
Scalar Product



Scalar (dot) product of vectors $\vec{A}$ and $\vec{B}$ — Magnitudes of $\vec{A}$ and $\vec{B}$

$$\vec{A} \cdot \vec{B} = AB\cos\phi = |\vec{A}||\vec{B}|\cos\phi$$

Angle between $\vec{A}$ and $\vec{B}$ when placed tail to tail



In terms of components:

Scalar (dot) product of vectors $\vec{A}$ and $\vec{B}$ — Components of $\vec{A}$ / Components of $\vec{B}$

$$\vec{A} \cdot \vec{B} = A_x B_x + A_y B_y + A_z B_z$$

Cross Product

The vector product of two vectors is written as $\vec{C} = \vec{A} \times \vec{B}$.

Magnitude of **vector (cross) product** of vectors $\vec{B}$ and $\vec{A}$

$$C = AB\sin\phi$$

Magnitudes of $\vec{A}$ and $\vec{B}$ — Angle between $\vec{A}$ and $\vec{B}$ when placed tail to tail

Picking out components perpendicular to eachother