Cornell Notes | Topic/Objective: | Name:

AVID

Crash Course in Vectors

Class/Period: 4 dh

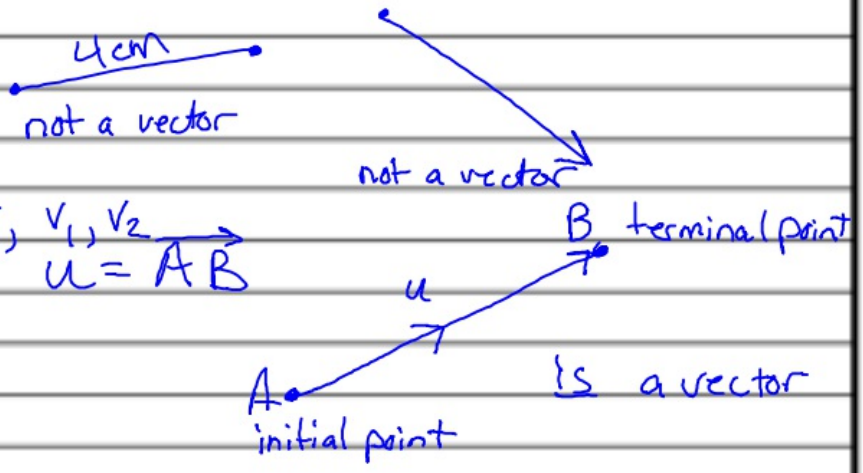
Date: 9/12/16

Essential Question: What is a vector and how do I add, subtract, multiply vectors?

Questions:

Notes:

def - a vector in the plane is a segment with an assigned direction. A vector has magnitude (length) and direction.



Two vectors are considered equal if they have the same magnitude and direction.

Where are vectors used?

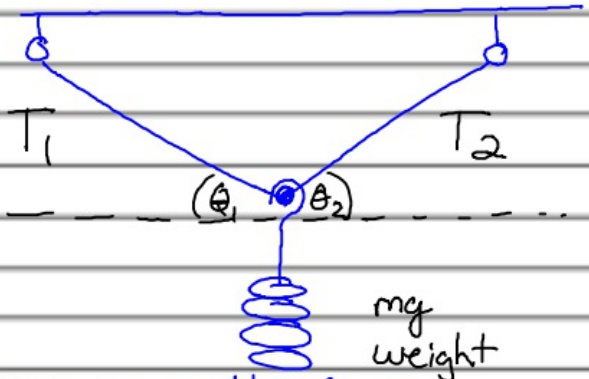
travel - maps

wind speed & direction

Physics

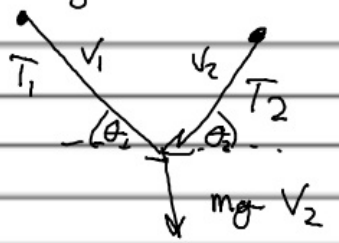
Forces: friction, gravity, push
Centripedal,

Ex)



Three Forces in equilibrium

free body diagram

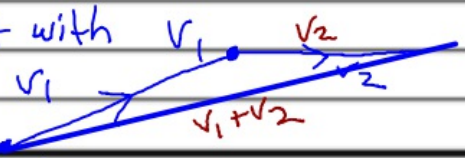


Geometric
Vector addition

find $V_1 + V_2$

adding two vectors results in a 3rd vector called the resultant vector.

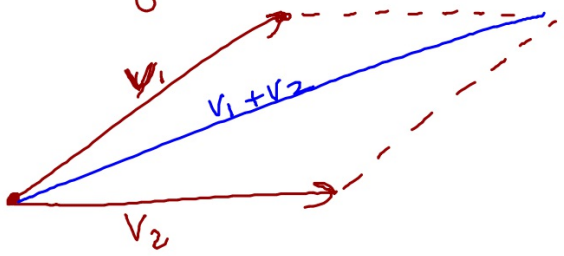
Step 1: start with V_1



Step 2: place the initial point of V_2 onto the terminal point of V_1

Step 3: connect initial of V_1 to terminal V_2

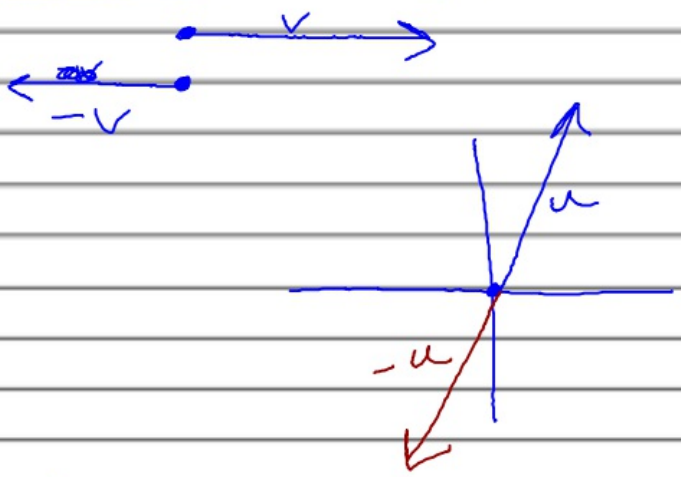
other way

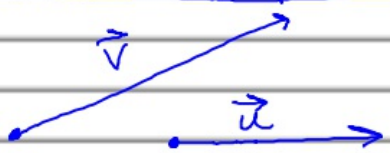


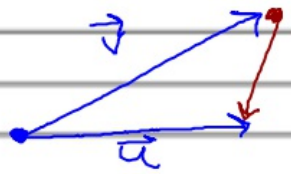
make a ~~parra~~ parallelogram

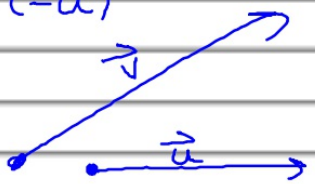
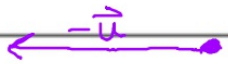
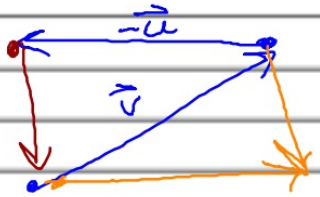
- the diagonal is the resultant vector

Questions:	Notes:
	Subtraction of vectors
notation for vectors - so we know $\vec{u}$ is not a variable.	$\vec{u}+\vec{v}$ $\vec{u}-\vec{v} = \vec{u}+(-\vec{v})$
	Geometric Representation
	find $\vec{v}-\vec{u}$
	Step 1: place the initial point of the 2nd ($\vec{u}$) onto the initial point of the 1st ($\vec{v}$)
	Step 2: connect the resultant vector, with initial point on the terminal point of the 1st.







Questions:	Notes:
	other way add the opposite! $\vec{v} - \vec{u} = \vec{v} + (-\vec{u})$  draw $-\vec{u}$  add: $\vec{v} - \vec{u}$  

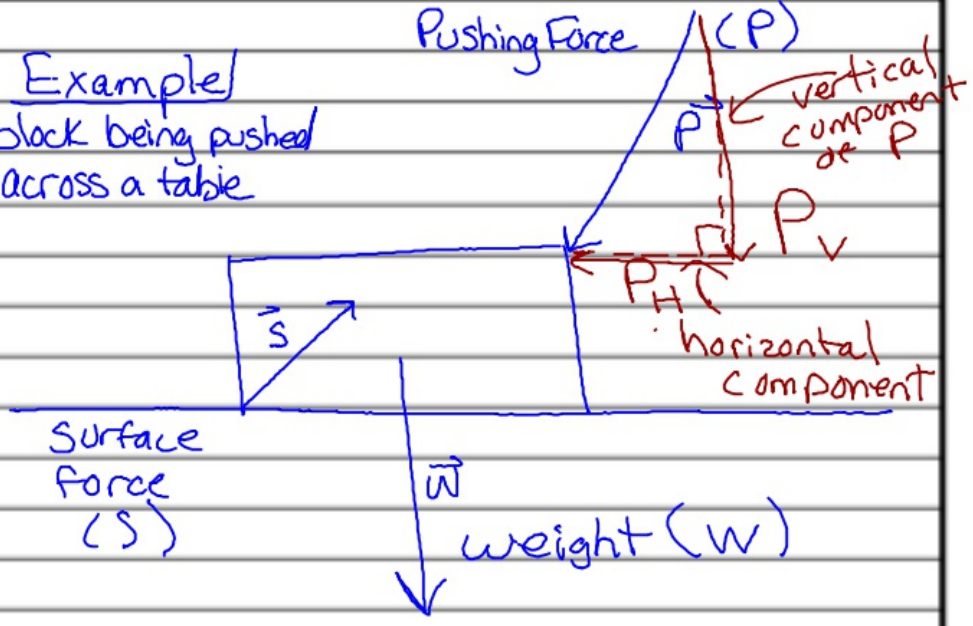
Questions:	Notes:

Component Vectors

When working with adjacent vectors that do not form a 90 degree angle, it is often useful to brake certain vectors

into component vectors. To do this, we draw two vectors, one horizontal, the other vertical. We then use trig to calculate the magnitude of the resultant vector.

Example
block being pushed across a table



Magnitude of a vector

$$|\vec{v}| = \sqrt{V_H^2 + V_V^2}$$

$$c = \sqrt{a^2 + b^2}$$

Standard Vector

one whose initial point is at the origin.