Acc Geometry
Expanding on Vectors- Notes Day 2

Physics Supplement

Any vector can be broken down into its x and y **components**

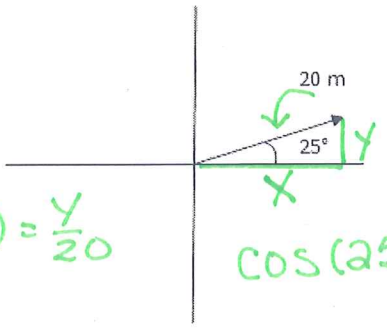
x-component - horizontal distance

y-component - vertical distance

Most ACC Students will be in Physics 11th grade

Using components will make some problems easier to solve

EX 1)



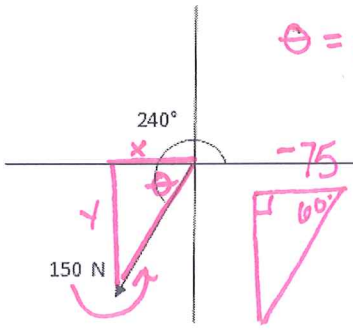
$\sin(25) = \frac{Y}{20}$

$\cos(25) = \frac{X}{20}$

x = 20 cos(25)

y = 20 sin(25)

EX 2)



$\theta = 240 - 180$

$150 \div 2$ in Qua III

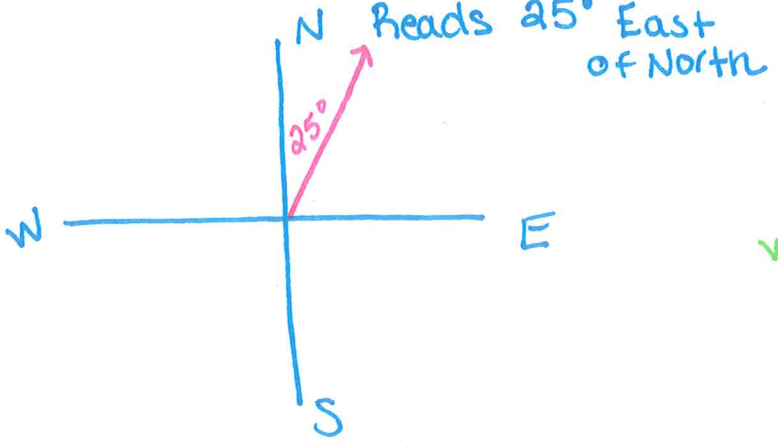
x = -75

y = $-75\sqrt{3}$

Review

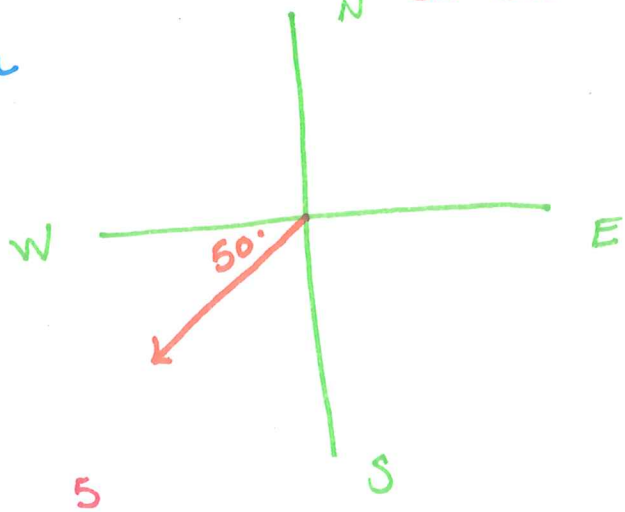
Real World Application

Ex3). Sketch a N 25° E Vector



Ex4). Sketch a W 50° S Vector

Reads 50° South of West



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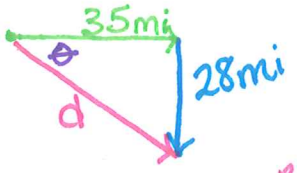
33. SHIPPING A freighter has to go around an oil spill in the Pacific Ocean. The captain sails due east for 35 miles. Then he turns the ship and heads due south for 28 miles. What is the distance and direction of the ship from its original point of course correction?



$d^2 = 35^2 + 28^2$

$d = \sqrt{2009}$

$d = 7\sqrt{41}$

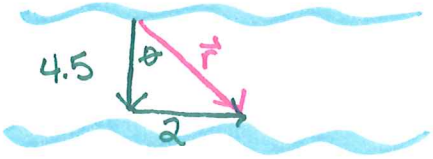
RR ≈ 44.82 miles

$\theta = \tan^{-1}\left(\frac{28}{35}\right)$

$\theta = 38.7°$

E38.7°S

34. RIVERS Suppose a section of the Minnesota River has a current of 2 miles per hour. If a swimmer can swim at a rate of 4.5 miles per hour, how does the current in the Minnesota River affect the speed and direction of the swimmer as she tries to swim directly across the river?

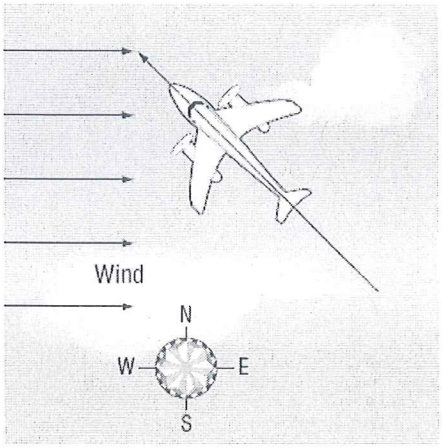


$|\vec{r}| = \sqrt{4.5^2 + 2^2}$ $|\vec{r}| = 4.9$mph ∴ it makes he/him go .4mph faster.

$\theta = \tan^{-1}\left(\frac{2}{4.5}\right)$ θ ≈ 24° angle off course

AVIATION For Exercises 51–53, use the following information.

A jet is flying northwest, and its velocity is represented by ⟨−450, 450⟩ miles per hour. The wind is from the west, and its velocity is represented by ⟨100, 0⟩ miles per hour. add

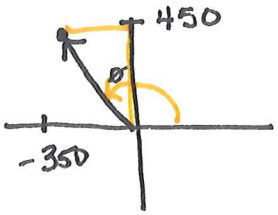


51. Find the resultant vector for the jet in component form.

52. Find the magnitude of the resultant.

53. Find the direction of the resultant.

51.) $\vec{r} = \langle -350, 450 \rangle$



52.)

$|\vec{r}| = \sqrt{350^2 + 450^2}$

$|\vec{r}| = \sqrt{325000}$

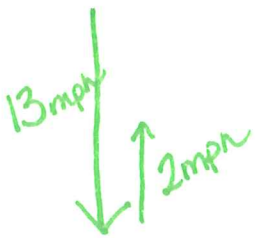
$|\vec{r}| = 50\sqrt{130}$ mph

53.) $\theta = \tan^{-1}\left(\frac{350}{450}\right)$

$\theta = 37.9°$

N 37.9 W

54. BIKING Shanté is riding her bike south at a velocity of 13 miles per hour. The wind is blowing 2 miles per hour in the opposite direction. What is the resultant velocity and direction of Shanté's bike?



11mph south