Addition of Vectors

LIKE #3. A boat crosses a river to a dock 1300 m away in 9 minutes. The current flows perpendicular to the boat's heading at 2.6 km/hr. What speed (in km/hr) and angle (from the shore upstream) must the boat proceed to reach the dock?

$9\,min \cdot \frac{1\,hr}{60\,min} = \frac{3}{20}\,hr.$

$\alpha = Tan^{-1}\frac{2.6}{8.67}$

$\alpha = 16°$ $\quad 74°$

$1{,}300\,m = 1.3\,Km$

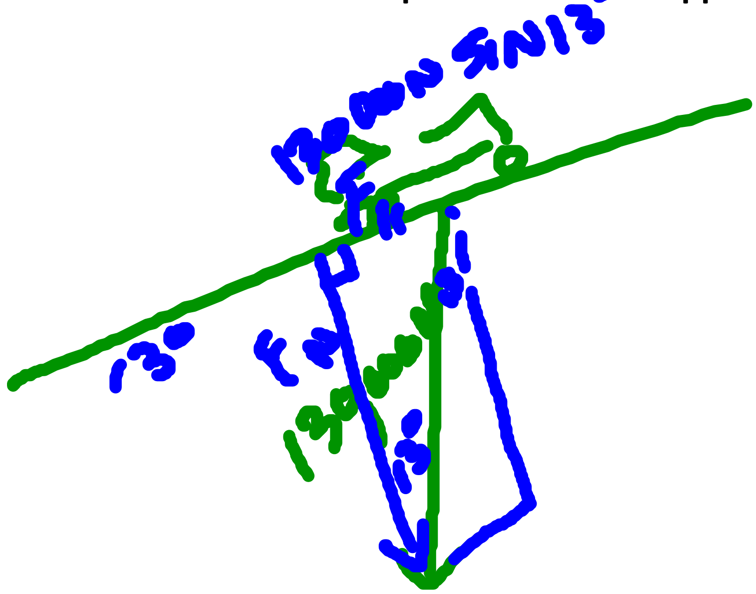
$V = \frac{s}{t} = \frac{1.3\,Km}{\frac{3}{20}hr} = \frac{26}{3}\,\frac{Km}{hr}$

$c = \sqrt{(2.6)^2 + (8.67)^2}$

VECTOR RESOLUTION

LIKE #1. A BOY PULLS A LOADED WAGON WITH A FORCE OF 130 N. The handle makes a 60° with the ground. What amount of force causes the wagon to move forward? What amount of force lifts the front of the wagon?

Like #2. A truck weighing 130,000 N is parked on a 13^{o} hill. What force must the parking brake provide to keep the truck from rolling down the hill? How much force must the road be able to push back at to support the truck?



Like #3. A 2,340 N safe is rolled up an inclined plane that is 9.0 m long and 2.6 m high at the upper end. Calculate:

a). the force that tends to make the safe roll down the ramp, and

b). the force that tends to want to break the ramp.

#4 A block of wood slides down a 26^{o} ramp at constant velocity.

Calculate the force that causes the block of wood to slide down the ramp? Just call the weight of the wood W for weight.

Calculate the normal force that the ramp has to support the block of wood. Just call the normal for N for normal.

Now take $f = \mu N$ and solve for μ and note now the easy formula that can be used for finding μ only knowing the angle.

Like #5. A mirrored ball hangs suspended by 2 cables which make 65^{o} angles with the walls. If the tension in each cable is 2600 N, calculate

a). the weight of the ball (Note: same as the Weight of the World Lab only 2 cables instead of 12)

b). the force trying to pull each cable out of the wall.