ADDITION OF VECTORS

Not room
To do problems
Properly here.

1. A motorboat heads due ~~east~~ *north 13* at ~~15~~ m/s across a river that flows due ~~south~~ *west 2.6* at ~~3.5~~ m/s.
   a. Draw a vector diagram, to scale, that represents the situation.

   b. Calculate the resultant velocity (speed _and_ direction).

   c. If the river is ~~500~~ *468* m wide, how long does it take the boat to reach the other side?

   d. How far downstream is the boat when it reaches the other side?

2. An airplane flies due ~~west~~ *south 117* at ~~120~~ km/hr, fighting a wind that is blowing due ~~north~~ *east 39* at ~~35~~ km/hr. Draw a vector diagram, to scale, to represent the situation. Calculate the resultant velocity (speed _and_ direction).

3. A boat crosses a river to a dock ~~1000~~ *1300* m away in ~~5~~ *9* minutes. The current flows perpendicular to the boat's heading at ~~30~~ *2.6* km/hr. What speed and angle over the ground must the boat proceed to reach the dock?

VECTOR RESOLUTION

1. A boy pulls a loaded wagon with a force of ~~125~~ *130* N. The handle makes a ~~30°~~ *60°* angle with the ground. What amount of force causes the wagon to move forward?

2. A truck weighing ~~100,000~~ *130 000 N* N is parked on a ~~25°~~ *13°* hill. What force must the parking brake provide to keep the truck from rolling down the hill?

3. A ~~2000~~ *2340* N safe is rolled up an inclined plane that is ~~30~~ *9.0* m long and ~~15~~ *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 ~~25°~~ *26°* ramp at constant velocity. Calculate the coefficient of friction between the block and the ramp.

5. A mirrored ball hangs suspended by 2 cables which make ~~35°~~ *65°* angles with the walls. If the tension in each cable is ~~3500~~ *2600* N, calculate (a) the weight of the ball and (b) the force trying to pull each cable out of the wall.