FLUIDS

More Than a Week After Irma, St. Martin Is Still Trying to Survive

French military personnel patrolling the island's streets on Tuesday.

GRAND CASE, St. Martin — The woman carried a small suitcase, enough for her and her child to try to start over.

The arduous passage to evacuate her broken island was nearly done — through the chaos of a port filled with capsized boats, the traffic-choked drive lined with buildings and homes torn from their foundations, and the desperation of the masses at the airport, hoping to flee the wreckageas armed soldiers kept order.
 But there is still almost no fuel or electricity, and food delivery, for now, remains erratic. A near total communication blackout throttles the island. Almost all of the schools are destroyed and will be closed for months, at best. "There's no news, no way to communicate," said Ms. Kabache, 56. The island will have to start from scratch, creating itself anew, physically and psychologically.

Tin roofing and smashed concrete line practically every street and alley, the disembodied bits of what was once a haven. To many residents, including some doctors working in the emergency room on the French side, the death toll seems much too low. It is widely seen as unfathomable that so many people could have survived the harrowing **Category 5 winds, which tore through the eastern Caribbean at speeds of up to 185 miles an hour.**

Storm Track Statistics . . . .

Date	Lon	Wind	Pressure	Storm Type
Aug 30	-30.3°	50 mph	1004 mb	Tropical Storm
Aug 30	-31.2°	60 mph	1001 mb	Tropical Storm
Aug 30	-32.2°	65 mph	999 mb	Tropical Storm
Aug 31	-32.9°	70 mph	997 mb	Tropical Storm
Aug 31	-33.8°	100 mph	979 mb	Hurricane
Aug 31	-34.8°	115 mph	967 mb	Hurricane
Aug 31	-35.6°	115 mph	967 mb	Hurricane
Sep 01	-36.5°	115 mph	967 mb	Hurricane
Sep 01	-37.8°	110 mph	972 mb	Hurricane
Sep 01	-39.1°	120 mph	964 mb	Hurricane

	Lon	Wind	Pressure	Storm Type
Sep 04	-52.3°	115 mph	961 mb	Hurricane
Sep 04	-52.6°	120 mph	947 mb	Hurricane
Sep 04	-53.3°	120 mph	944 mb	Hurricane
Sep 04	-53.8°	120 mph	944 mb	Hurricane
Sep 04	-54.4°	130 mph	944 mb	Hurricane
Sep 04	-55.0°	140 mph	943 mb	Hurricane
Sep 04	-55.6°	140 mph	943 mb	Hurricane
Sep 05	-56.4°	145 mph	939 mb	Hurricane
Sep 05	-57.0°	150 mph	937 mb	Hurricane
Sep 05	-57.7°	175 mph	929 mb	Hurricane
Sep 05	-57.7°	175 mph	929 mb	Hurricane
Sep 05	-58.4°	180 mph	931 mb	Hurricane

Note: Graph of wind(blue line)speed and air pressure(red line) vary inversely. From hurricane edge to eye wall the speed increases as pressure decreases (black arrow)

INTRODUCTION: Hurricane IRMA had very high speed winds with corresponding low pressure (see table at left). According to **Bernoulli's Law** on energy conservation for fluids …air pressure is inversely proportional to square of air speed.

$$\tfrac{1}{2}\,\rho\, v^2 + P = \text{constant}$$

Where ρ = air density ~ 1.225 kg./m.^{3}
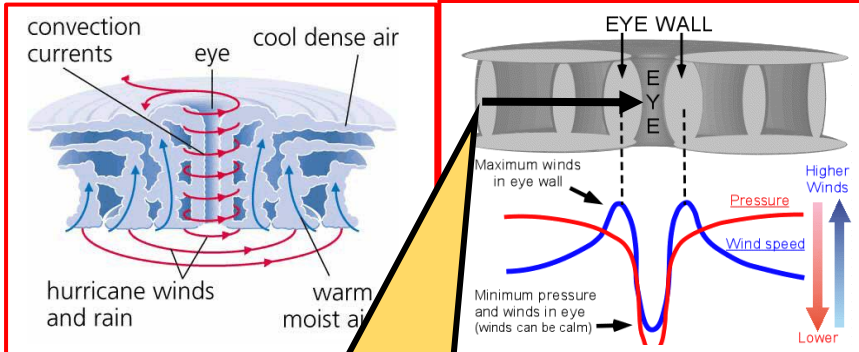Object of this application is to find $[1/2\rho v^2]$ for six wind data pints in hurricane Irma. Then, on graph paper, graph $[1/2\,\rho\, v^2]$ on Y axis and corresponding pressure in mb (milli bar units) on X axis.

QUESTIONS: (a) Find $[\tfrac{1}{2}\rho v^2]$ for these six wind speeds in table at left: 175 mph,150,130,115,100,70 mph. Be sure to convert mph to m./s. first using 0.447 m./s. = 1 mph. Units will be:(kg./m.^{3})(m.^{2}/s.^{2}) = N/m.^{2} , (b) On 8 ½ X 11 inch graph paper Graph $[\tfrac{1}{2}\rho v^2]$ vs. corresponding pressure In mb listed on table at left. (c) Does the graph confirm **Bernoulli's Law**?

ANSWERS: (a) 3748 N/m.^{2} for 918 mb

150 mph	2754 "	"	929 "
130 "	2069 "	"	944 "
115 "	1619 "	"	964 "
100 "	1225 "	"	972 "
70 "	600 "	"	997 "

(b) Graph should show{$1/2\,\rho\, v^2$] decreases as pressure increases., (c) Yes! Confirmation.