Math 25

When sodium carbonate is dissolved in water, the gas carbon dioxide is generated. The amount of gas generated is measured by measuring the pressure exerted by the gas. The more the sodium carbonate there is, the more gas is generated and the greater the pressure exerted by the gas. We want to determine the relationship between the amount of sodium carbonate and the pressure exerted by the resulting gas. The following is an experimental result of a chemistry student:

W (grams)	P (cm of mercury)
0.00	0.40
0.10	0.90
0.25	2.15
0.40	2.90
0.55	4.00
0.70	4.90

(a) Plot the points on a graph paper.

(b) Draw the line that seems to "fit the data the best".

(c) Find the equation of the "best fitting line" that you drew in (b). (Locate two points on the line, and use their coordinates to find the equation.)

(d) Using the equation that you obtained in (c), compute the pressure generated by a sample that contains 0.62 grams of sodium carbonate. Compare the value with the value that you can read off the graph of (b).

(e) An unknown sample is known to contain sodium carbonate and no other gas producing substance. When the sample is dissolved in water, the pressure exerted by the resulting gas turns out to be 4.25 cm of mercury. Find the amount of sodium carbonate present in the sample.