# Introductory Assignment

## Due Monday, September 21.

Instructions

Do this assignment on your own and then get together with someone else in the course to compare your results. Try to arrive at a consensus and be able to support your conclusions by reasoning (in straightforward English). Each person must turn in his or her own assignment. Put you name at the top of the paper and list your collaborator at the bottom.

Filling Bottles
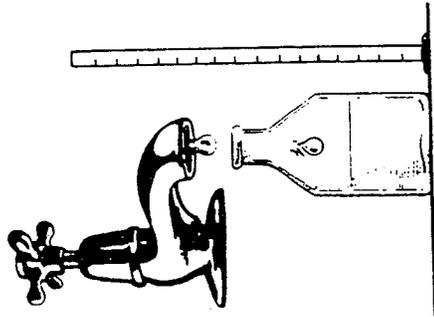
In order to callibrate a bottle so that it may be used to measure liquids, it is necessary to know how the height of the liquid depends upon the volume in the bottle.
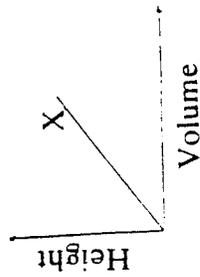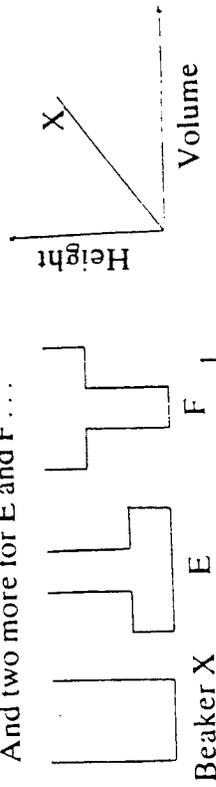
The graph below shows how the height of liquid in beaker X varies as water is steadily dripped into it. Copy the graph, and *on the same diagram*, show the height-volume relationship for beakers A and B.

Beaker X   A   B
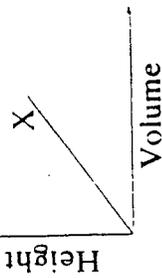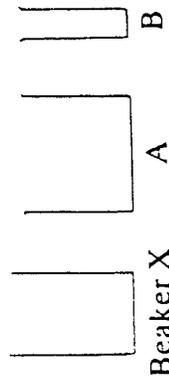
Sketch two more graphs for C and D …

Beaker X   C   D
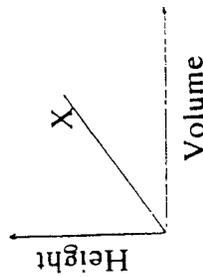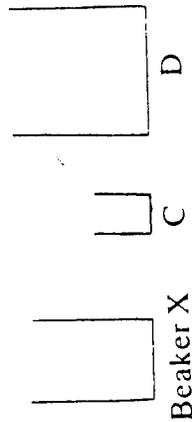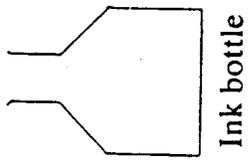
And two more for E and F …

Beaker X   E   F

Here are 6 bottles and 9 graphs.
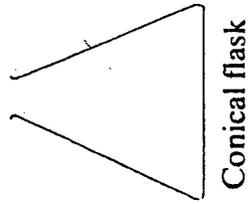
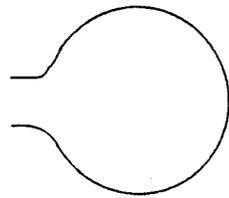Choose the correct graph for each bottle.

Explain your reasoning clearly.

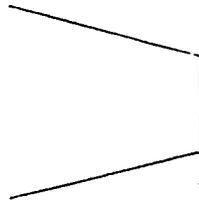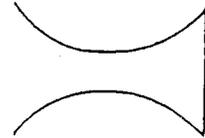For the remaining 3 graphs, sketch what the bottles should look like.

(a) Height / Volume

(b) Height / Volume

(c) Height / Volume

(d) Height / Volume

(e) Height / Volume

(f) Height / Volume

(g) Height / Volume

(h) Height / Volume

(i) Height / Volume

Conical flask

Ink bottle

Bucket

Evaporating flask

Plugged funnel

Vase

2

3