The Crow and the Pitcher activity[1]

Team members   1. ………………………………………………..   2. ………………………………………………….

3. ………………………………………………..   4. ………………………………………………….

5. ………………………………………………..   6. ………………………………………………….

In this activity, you will simulate the story of "The Crow and the Pitcher" using a graduated cylinder and marbles.

Experiment: Fill your graduated cylinder with water, up to 100 mm height. You will be adding marbles (*one at a time*) until the water reaches a level of at least 120 mm—the level at which the crow can reach the water.

Question 1: Complete the first five rows of the table on the right. The water level has *not* raised enough, but can you predict how many marbles you will finally need to reach your goal of the 120mm height?

We believe that if we have a total amount of .... marbles inside the graduated cylinder, then the height of the water level will be about 120mm.

Number of marbles n	Height of water level (mm) h
0	100
1	
2	
3	
4	
5	
6	
7	
8	

Question 2: Keep adding marbles, and complete the table above. Was your prediction correct?

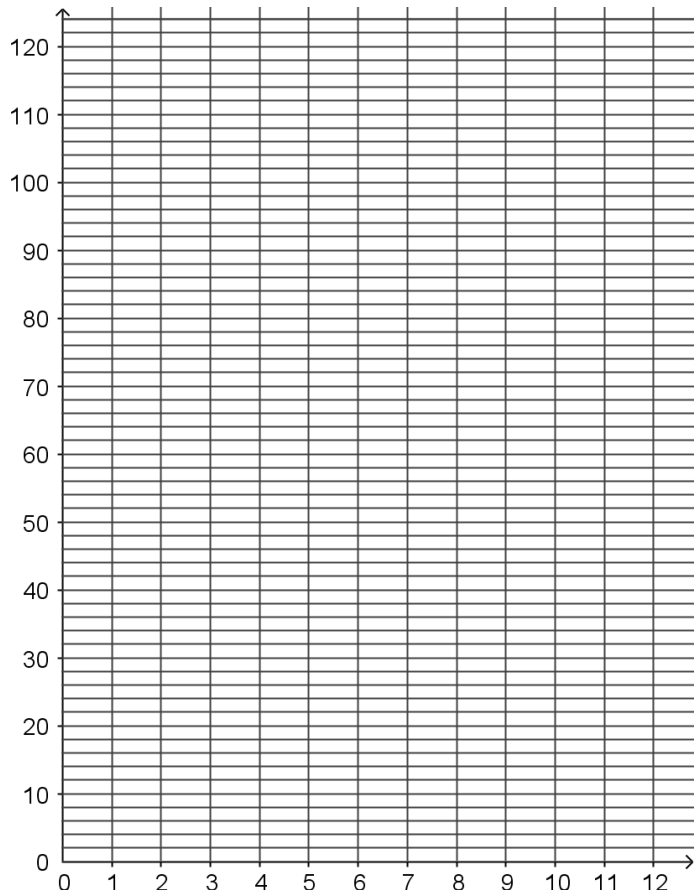Try to represent your inputs graphically. What do you notice?

………………………………………………………………………..

Question 3: Can you find a rule that relates the variable "h" (height of water level) to the variable "n" (number of marbles)?

Write it in the space below:
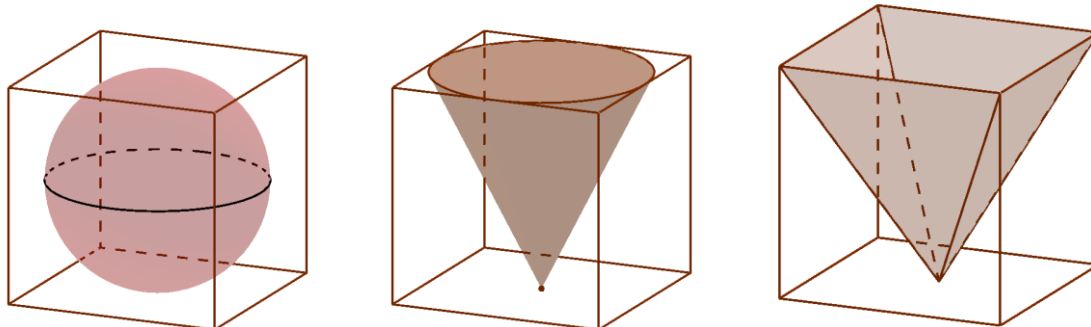
………………………………………………………………...........

Figure out which of the two variables is dependent and which is independent.

[1] This activity is based on a lesson plan of National Council of Teachers of Mathematics (NCTM) published in "Illuminations": http://illuminations.nctm.org/lesson.aspx?id=3667

The three curves

We have three empty pots:

1. A ball of radius 5cm
2. A cone of height 10cm and circular base of radius 5cm. Stands with its peak.
3. A pyramid of height 10cm and square base with side 10cm. Stands with its peak.

Experiment: We fill them gradually with water (10ml per second) and so the water level rises in each pot.

Question 1: Which of the following three curves corresponds to the height of water level inside the ball (as the water volume increases) and which inside the cone or inside the pyramid?
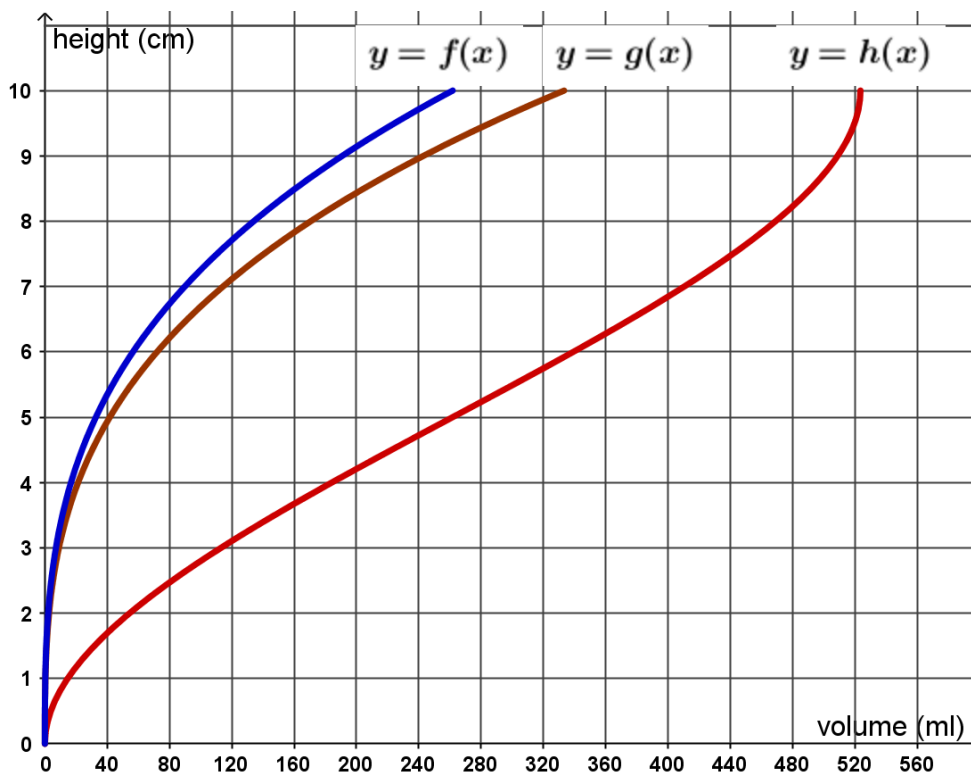
Complete the statements (*ball, cone, pyramid*)

1. Function f expresses how the water level rises inside the ……………….
2. Function g expresses how the water level rises inside the ……………….
3. Function h expresses how the water level rises inside the ……………….

Question 2: Which pot contains the greatest amount of water when filled? …………………