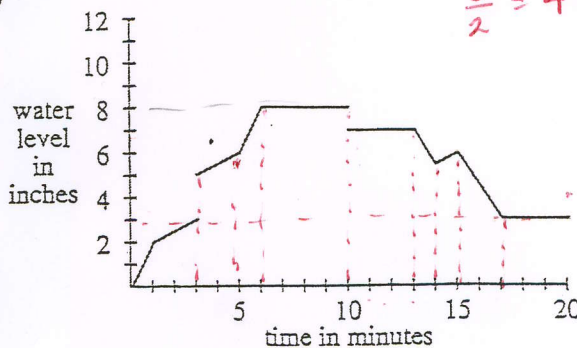
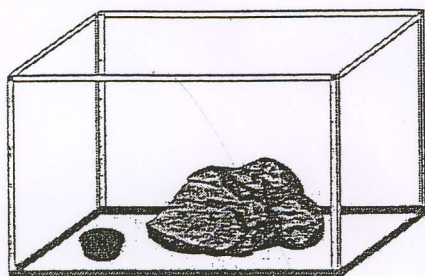
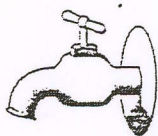
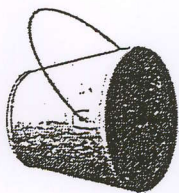


# Math 121 Project 1

Name KEY

An illustration of an aquarium and a graph of its water level as a function of time is shown below. When the faucet is on, the water level rises at a steady rate. Similarly, when the plug is pulled out, the water level falls at a steady rate that is slower than the faucet's rate. At various times, some events happen that affect the water level and/or the rate at which the water level changes. In the exercises below, you are asked to identify at EXACTLY what time  $t$  the given event occurred.

1. What are the domain and range of the function as graphed?  $dom = [0, 20]$   $range = [0, 8]$
2. The plug is pulled out with the faucet turned off.  $t = 13$
3. A large rock is pulled out of the aquarium.  $t = 10$
4. The plug is pulled out with the faucet turned on.  $t = 1$
5. The plug is put in with the faucet turned off.  $t = 17$
6. The plug is put in with the faucet turned on.  $t = 5$
7. The faucet is turned on with the plug in.  $t = 0$
8. The faucet is turned on with the plug out.  $t = 14$
9. A bucket of water is dumped into the aquarium all at once.  $t = 3$
10. The faucet is turned off with the plug in.  $t = 6$
11. The faucet is turned off with the plug out.  $t = 15$
12. Now assume that the rock is put back in at  $t = 20$  and the faucet is turned back on at the same time. If the aquarium is 12 inches deep when will it overflow?  $t = 24$



at  $t=3$  add 1 inch  
rate is 2"/minute  
 $12 - 4 = 8$   
 $\frac{8}{2} = 4$  minutes