Information into Formulas and Graphs

In the following problems, build a formula for the situation and then use Graph Sketcher or a graphing calculator to plot the function. Copy a sketch of the function on some graph paper, labeling several points on the graph.

1. You have a rectangular room whose length is always twice as big as its width. Write a formula that describes the area in terms of its width. Then plot this formula as a function.

2. You have a rectangular room that MUST have an area of 1. Write a formula that describes the width as a function of length (Hint: A = Length * Width) and graph it.

3. You own a pizza shop and you want to write a formula that describes how long the pizza pies are around the edges (the pizza pie's circumference). Write and graph a function of circumference versus the radius of the pizza pie. Use 3.14 (or a more exact approximation) as Pi.

4. Now plot a graph (after, of course, writing a formula) for the area of the pizza pies you are selling versus their radiuses.

5. You are making right triangles that have a constant height of six. Your employer wants to know a formula for finding out the area of the triangles so he can know how much material he needs to buy. Give him both the formula and in addition a graph of the area of a triangle versus its length (to impress him even further).

6. You work in a company and your employer has decided to give everyone working under him a raise. His two possibilities are to: (1) raise the salary by $2 per hour and then raise the salary by 10% or (2) raise the salary by 10% and then give an additional $2 dollars per hour. Plot a graph of both of these salaries. Which is better for the employees? Which is better for the employer?

7. Your mom has a new system for the amount of allowance you will receive per week. The amount you receive next week will increase according to your mom's formula: $a_{w+1} = a_w + 1$, where a stands for allowance and w is the number of the current week.

Your allowance for the first week is 1 dollar ($a_1 = 1$). What is your allowance for weeks 2 and 3? Plot a graph of your allowance vs. time for the next few months.

8. You are watching your friend's pet bacteria collection while he is gone on vacation. On the first night you notice that there are two bacteria in their dish. You know that the number of bacteria is governed by the following function: $b_d = 2*b_{d-1}$, where b stands for the number of bacteria and d stands for the day you are on. Plot a graph of the bacteria as a function of days. (Remember that $b_1 = 2$).

9. You are an astronaut exploring the far reaches of space. You land on a planet called ZXCI. On ZXCI, the main inhabitants are Goofs. During your first day on ZXCI you count 2 Goofs. You soon discover though that Goofs have an unusual growing rate: $g_d = g_{d-1}2$, where g is the number of Goofs and d is the number of days. Plot a graph of the population of Goofs as a function of days.