Precalculus Worksheet on Exponential Functions

1. Listen to the beginning of "*The King's Chessboard*" by David Birch. Use this worksheet to figure out how much rice the king must give the wise man. Check out www.freerice.com for new vocabulary words.

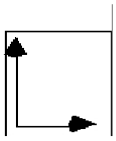
2a. Fill out the top rows of the chessboard with the number of new grains given on that square:

b. Instead of adding all the rice for each square to find the total, let's see if we can find a pattern of how much rice has been given cumulatively for each day.

Days	Total	Total + 1
0		
1		
2		
3		
4		
5		
…		

Since 1 more grain of rice won't make much of a difference, I suggest that the king give the wise man 1 extra grain of rice before he starts the chessboard. (Consider this the rice for the 0th day.) Why will this make your job easier?

3. Sketch a graph of your function on graph paper. Orient your graph paper this way and make sure your axes are as shown:



4. Since we like to work with continuous functions (a curve), connect the points on your graph and assume that you can read the graph at any place on this curve. Use your graph to estimate the following and fill in the *table on the next page*:
a. What is the total number of grains given after 2.5 days? after 3.5 days? after 4.5 days?
b. Is the rate of change the same for one more day? [This type of growth is called exponential. It is similar to the reproduction of rabbits, the growth of bacteria and compound interest growth on bank accounts.]
c. Determine the equation of the curve with x representing the number of days and y representing the total number of grains given.