Third Homework
Geology – Physics 30

1.   Recall the linear map we discussed in class for a bank loan:

$$x_{n+1} = x_n + r\,x_n$$

where r is the (simple) yearly rate of interest. Use this equation to calculate how much interest will accrue after 5 years in a bank account with a starting balance of $10,000 for the following interest rates. Do this problem with a calculator, and make a table of the results for each of the 5 years.

   a)   2%

Year	Increase	$$
1		
2		
3		
4		
5		

   b)   4%

Year	Increase	$$
1		
2		
3		
4		
5		

        Note: The average long term rate of return of the Stock Market per year is about 6%. A bank pays about 0% right now on savings. Most of you are young...put your money in the stock market or a good ETF…

2.   Repeat problem 1), but now use the graphical method we discussed in class.

3.   How would the final result change if you spent 40% of the money you made in interest that year at the end of every year? (like, for example, income taxes!). In other words, repeat calculations in 1) but take away 40% of the interest each year.

a)   2% * 60% = 1.2%

Year	Increase	$$
1		
2		
3		
4		
5		

b)   4% * 60% = 2.4%

Year	Increase	$$
1		
2		
3		
4		
5		

4.   Read the New York Times article (URL on the web site). Write a paragraph discussing how the existence of power laws and "fat tails" in the financial markets may influence your thinking on investing and saving.