

## Math 107

### Exponential Excel HW – Exponential Growth and Decay

1) Mr. Wildman has given you \$1000 for being his favorite student. You decide to invest it in an account that earns 6% interest every year

a) Create a two column table in Excel – the first column for years and the second for amount of money in the account. Use formulas for each column. Drag the columns out enough to answer the following questions

- i. How money will be in the account after 10 years? After 20 years? After 25 years?
- ii. How long will it take for the amount of money in the account to double

b) Now suppose you start with \$2000 instead of \$1000 with the same interest rate per year. Create a two column table in Excel (use another sheet) – the first column for years and the second for the amount of money in the account. Use formulas for each column. How long will it take for the amount of money to double? What does this say about the initial value of money in the account and time it takes to double?

c) Now suppose you have \$2000 but invest at 12% per year instead of 6% per year Create a two column table in Excel – the first column for years and the second for amount of money in the account. Use formulas for each column. Drag the columns out enough to answer the following questions

- i. How money will be in the account after 10 years? After 20 years? After 25 years?
- ii. How long will it take for the amount of money in the account to double

2) Use an Excel Spread sheet to prove correct or disprove the following statement:

The library at a certain university reported that journal prices have increased by 140% over the last 10 years. They then reported that this was equivalent to a 14% increase per year. Is this true? What percent increase over ten years would have resulted from a 14% increase per year?

Hint: Select a starting price for the journal and see if by increasing this amount 14% per year you end up with a 140% increase over the ten year period. Include all calculations in Excel

3) The saga of two Squirrels in the United Kingdom. The red squirrel (pictured at left below) is native to the United Kingdom. The grey squirrel (pictured at right) is not. But in the mid 1800's lords at certain British estates preferred grey squirrels and imported them from North America. This was a problem for the red squirrels since Grey squirrels have numerous advantages over their red cousins (increased size, larger litters, immunity to squirrel pox, no natural predator in UK) as a result grey squirrel numbers have soared and reds fallen dramatically. In order to save the native species parts of the UK have created "refuges" for the red squirrels, but many have been invaded by the greys

- i. Create an Excel Spreadsheet for the population of both red and grey squirrels. Assume the Grey squirrel population started at 1000 and doubles every 6 seasons. Create with first column number of seasons and second column population
- ii. Now create another column for the population of red squirrels. Assume the initial population is 150000 and the population declines by one half every 8 seasons
- iii. When will the population of greys be greater than the population of reds? Will there be a point where the population of grey squirrels is double that of red squirrels? When is this?
- iv. Draw a graph with the populations of both squirrels in Excel

