Worksheet 2

Exponential Functions

y- dependent variable

x – independent variable (usually time in days, weeks, months, years)

a – initial value (the amount you start with)

c- rate of growth or decay (if 'c' is greater than 1.0 --> y gets bigger as time goes by)

                        (if 'c' is smaller, between 0 and 0.99 --> y gets smaller as time goes by)

1. Situation:
   You invest $1 in the stock market and it doubles in value after the first month.
   Instead of taking your money out (now $2), you leave that money in the market and it doubles in value again the next month (now $4).
   This process repeats itself over and over again, every month, for a full year.

   Questions:
   a) What is the independent variable, x? _____

   b) What is the dependent variable, y? _____

   c) What is the initial value, a (amount you start with)? _____

   d) What is the rate of growth (how much does the money grow by every month)? _____

   e) What is the rule for this exponential function? _____

   f) Make a table of values for this function and quickly sketch what it would look like.

x	y
1	
2	
3	
4	
5	
6	

   g) How much money will you have in the market at the end of a full year (12 months)?

2. A cute and cuddly alien lands on planet Earth after crash landing on a meteorite. When she lands, the alien measures 0.30m in height (about the size of a standard ruler). After being exposed to our rich sunlight, the alien grows by 50% of its own height every week. What will the alien's height be after two months (8 weeks) and six months (26 weeks)?

Build the Rule:

- Variables: _____
- Initial value (a): _____
- Rate of Growth/Decay: _____
- Rule: _____

Answers:

- After 2 months (8 weeks): _____
- After 6 months (26 weeks): _____

3. You are 16 years old when you get your first summer job.
   At the end of the summer, you invest $2000 in a retirement fund.
   That money grows by 10% each year.
   If you leave that money alone and never invest another dime, how much will be in the account when you retire at 65? What will it be worth if you retire 5 years early (age 60)?

Build the Rule:

- Variables: _____
- Initial value (a): _____
- Rate of Growth/Decay: _____
- Rule: _____

Answers:

- Retirement fund at age 65: _____
- Retirement fund at age 60: _____

4. A car typically loses 9% of its value every year.
   A brand new Honda Civic costs $21 960.
   How much will the car be worth in 4 years?
   How much will the car be worth in 10 years?

Build the Rule:

- Variables: _____
- Initial value (a): _____
- Rate of Growth/Decay: _____
- Rule: _____

Answers:

- Value of the Civic in 4 years: _____
- Value of the Civic in 10 years: _____

5. The value of Stefan's autograph increases by 13% every year. The value of his autograph in 2016 was $5 (he's quite famous!). What will be the value of his autograph in the year 2025?

Build the Rule:

- Variables: _____
- Initial value (a): _____
- Rate of Growth/Decay: _____
- Rule: _____

Answer:

- Value of the autograph in 2025: _____