Exponential Models – Practice

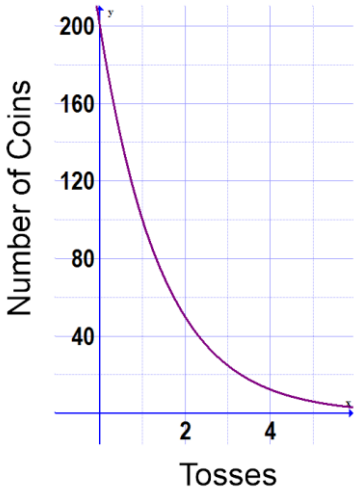
1. Determine whether each number sequence represents linear, quadratic or exponential growth. Explain.

a. 10, 20, 30, 40 b. 1, 4, 9, 16 c. 2, 4, 8, 16

2. A newspaper headline reads “House Prices Rising Exponentially”. Average housing prices for the past four years are shown below. Is the headline correct? If it is not, correct the heading. Justify your answer.

Year	Average House Price ($)
2004	140,000
2005	157,000
2006	176,000
2007	197,000

3. Jason started with 200 pennies. He tossed them all into the air and removed all of those that came up heads. He repeated this experiment several times and plotted the points of data and drew a curve of best fit to show the number of coins remaining after each toss.



a. Describe the relationship between number of coins remaining and the number of tosses.

b. Estimate the number of coins after 1, 2, 3 and 4 tosses and determine the ratios between them. Does this relationship seem to be exponential? Explain.

c. What happens to the number of coins after each toss? Does this make sense?

4. Emily invested $5000 in a Guaranteed Investment Certificate (GIC) five years ago. The yearly value of the GIC is shown in the table below.

Year	Value of GIC ($)
0	5000.00
1	5400.00
2	5832.00
3	6298.56
4	6802.44
5	7346.64

a. Calculate the first and second differences. Is the relationship between value and time linear, quadratic? Explain how you know.

b. Calculate the ratios. Is the relationship exponential? Explain how you know.

c. What percent was this investment earning each year? Explain how you know.

5. The general equation for exponential growth is $y = a (1 + r)^x$, where a is the initial value, r is the growth rate as a percent and x and y are the independent and dependent variables respectively.

a. Create an exponential growth equation for the relationship presented in question 4.

b. Verify the correctness of your equation by substituting 0, 1, 2, 3, 4 and 5 in for the independent variable.

c. Use your equation to determine the value of the GIC after 10 years.

6. The general equation for exponential decay is $y = a (1 - r)^x$, where a is the initial value, r is the decay rate as a percent and x and y are the independent and dependent variables respectively.

a. Create an exponential decay equation for a car initially worth $25,000 that depreciates in value by 25% each year. Use your equation to calculate the value of the car after 10 years.