Name: _____   Date: _____

Learning Goal 0.1	Expectations for graphing from previous years.

1. For each of the following functions, determine
   a. The type of function.
   b. The x – intercept(s).
   c. The y – intercept.
   d. The domain and range.
   e. A sketch of the graph.

   i. $y = \sqrt{x + 4}$.
   ii. $y = (x + 1)^2(x - 4)$
   iii. $y = \sqrt{x + 9} - 1$
   iv. $y = \dfrac{6}{x + 3}$
   v. $y = 3^x$

2. The following function is used in biology to give the growth rate of a population in the presence of a quantity of food x. This model is called 'Michaelis – Menton' kinetics.
$$y = \frac{Kx}{A + x}$$
   a. Graph the function for $K = 5$ and $A = 2$. What are the domain and range (consider the context of the problem)?
   b. What is the horizontal asymptote for this function? What do you think K represents?
   c. Show that A represents the quantity of food for which the growth rate is at half its maximum.

3. In Canada, the inflation rate is about 1.8%. The value of A dollars in t years is given by the function
$$y = A(1.018)^t$$
   a. What kind of model is this?
   b. Is the function increasing or decreasing?
   c. Suppose a car cost $14 000 today. Use the model to estimate the cost in 20 years.
   d. Find the cost of a $50 textbook in 60 years.

4. During the early part of the 20th century, the deer population in Arizona experienced a rapid increase because hunters reduced the number of predators. This depleted the food resources for the der and resulted in a population decline. For the period from 1905 to 1930, the deer population can be approximated by the following function where x is the time in years from 1905.
$$y = -0.125x^5 + 3.125x^4 + 4000$$
   a. Use desmos to graph the function. What kind of function is this?
   b. Over what period of time was the population increasing? Decreasing?
   c. What was the maximum population of the deer? What year was that in?