Name:

Quiz 4: §1.6-1.8

Complete the following problems to the best of your ability. **SHOW ALL OF YOUR WORK.** Unshown work will not be graded. You may use a calculator.

1. Suppose the number of bats in a vampire's castle, B, is given as $B(x) = -x^2 + 44x - 434$, where x is the temperature of the castle in degrees Celsius.

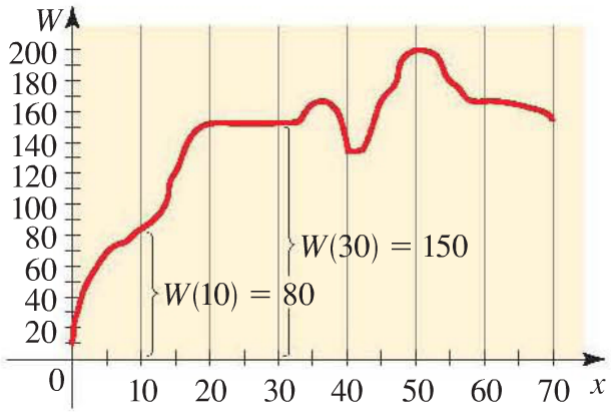
   (a) Calculate and interpret $B(20)$.

   (b) What temperature is the castle if there are 35 bats in the castle?

   (c) Does this model make sense for any x-value that we could plug into it? Why or why not?

2. Suppose a store selling snacks for llamas sells the snacks for \$1.50 each, but gives a surplus discount and only charges \$.90 for anyone who buys more than 100 snacks in one order. Write and graph a piecewise function that gives C, the cost of buying x snacks.

3. Consider the graph of the function that gives W, the number of space whales in a certain pod, as a function of x, the number of years since 3000.



Using the graph, answer the following questions:

(a) What are the domain and range of the function $W(x)$?

(b) How many space whales were in the pod in 3030?

(c) During which years was the population of the pod increasing? During which years was it decreasing? During which years was it constant?