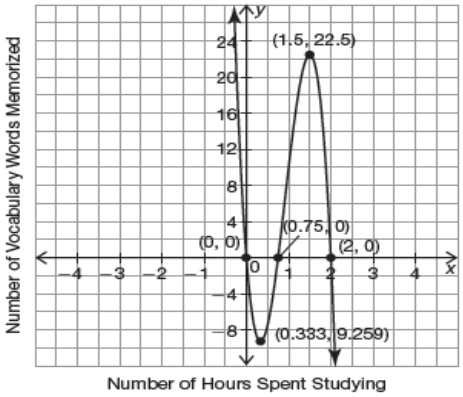
Secondary Math III
Analyzing Polynomial Functions
Assignment 4.1

Name: _____
Period: ____

1. The graph shows the number of vocabulary words a student is able to memorize based on the amount of time studying. **Use the graph to answer the questions**.



   a. How many vocabulary words does the student know at beginning of the study?

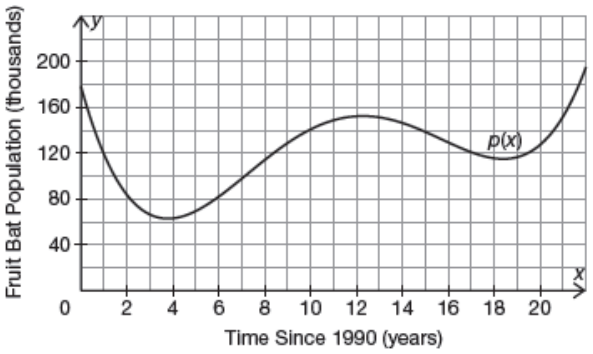
   b. What is the minimum amount of time the student studies before they begin to remember the vocabulary?

   c. How long did the student need to study in order to remember 22 vocabulary words?

   d. The graph has an x-intercept at (2,0). Describe the activity of the student at this point in terms of the problem situation.

2. Biologists conducted a 20-year study of fruit bat populations in a small African country. The polynomial function $p(x)$ models the fruit bat population from the year 1990 (when $x = 0$) to 2010 (when $x = 20$).

   a. During the 20-year study, a law was passed banning use of a pesticide known to be harmful to the fruit bat. From the graph, estimate the year the law passed.



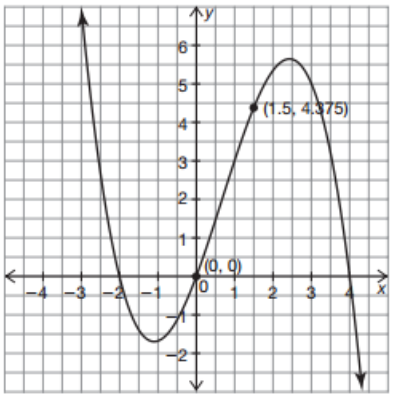
   b. Estimate when the fruit bat population was 100,000.

   c. At what point during the 20-year study was the fruit bat population the highest? What was the population at that time?

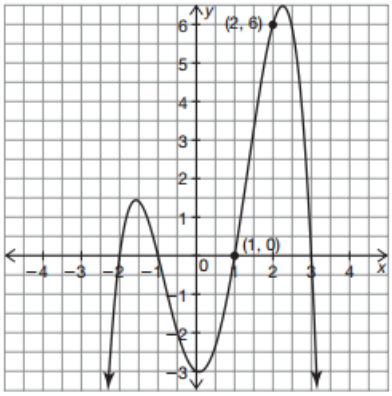
   d. Determine the average rate of change of the fruit bat population over the entire 20-year study. Explain the meaning of your answer in terms of the problem situation.

Determine the *average rate of change* for the given interval for each polynomial function. *Show work*! Round answers to thousandth place (3 decimal places).

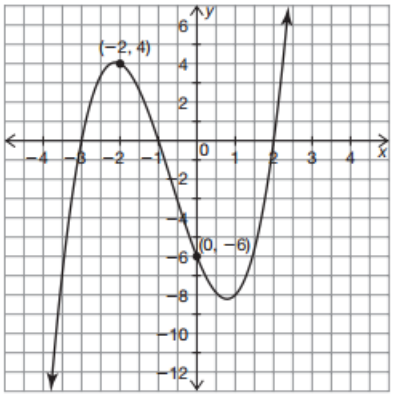
3. from $x = 0$ to $x = 1.5$



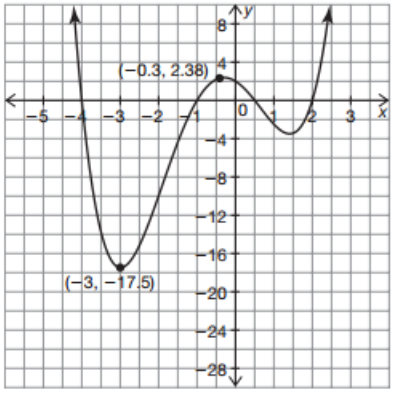
4. from $x = 1$ to $x = 2$



5. from $x = -2$ to $x = 0$

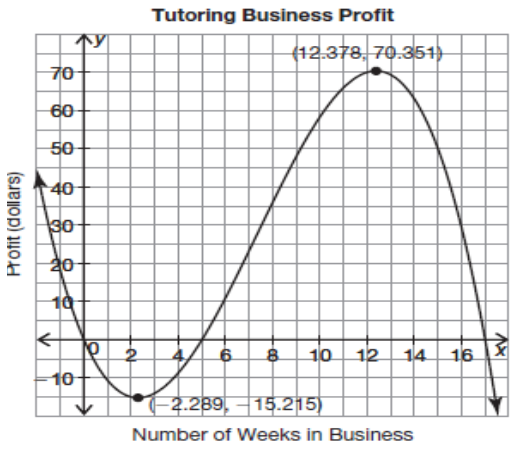


6. from $x = -3$ to $x = -0.3$



For problems 7-8, answer the question and *circle* the location on the graph where the information was found.

7. The graph models the profit of a group of students earns running a tutoring business. After how many weeks did the group start to earn a profit? Where is this information located on the graph?



8. The graph models the number of gallons of water that are filtered at a filtration plant each hour. How many gallons of water has the plant filtered after running for about 4.5 hours? Where is this information located on the graph?