# Chapter 14 – 1b Area Between Curves

**Example 1.** An amusement company maintains records for each video game it installs in an arcade. Suppose that and represent the total accumulated costs and revenues (in thousands of dollars), respectively, years after a particular game has been installed. If

find the area between the graphs of C’ and R’ over the useful life of the game and interpret the results.



The total profit generated by the game over the 5-year life of the game is about $13,306.

**Example 2.** A yeast culture is growing at a rate of grams per hour. Find the area between the graph of and the -axis over the interval and interpret the results.



The mass of the yeast culture grew by approximately 5.15 grams over the 10 hour period.

**Example 3.** A beginning high school language class was chosen for an experiment on learning. Using a list of 50 words, the experiment involved measuring the rate of vocabulary memorization at different times during a continuous 5-hour study session. It was found that the average rate of learning for the entire class was inversely proportional to the time spent studying and was given approximately by



Find the area between the graph of and the -axis over the interval and interpret the results.

On average, the students in the class learned about 6 words during the 3rd hour of the study session.

**Example 4.** Find the area between the curves and on the interval .



**Example 5.** Find the area between the curves and on the interval -3.

Note: . This is the cumulative signed area between the two curves. When the blue curve is above the red curve, the area is positive. When the blue curve is below the red curve, the area is negative.