# Chapter 13 – 5b The Fundamental Theorem of Calculus

**Example 1.** Evaluate

or, integrating by substitution

and

**Example 2.** Evaluate

or, integrating by substitution

**Example 3.** A company manufactures mountain bikes. The research department produced the marginal cost (in dollars per bike) function:

where is the number of bikes produced per month. How much will the total cost increase if the production level goes from 300 bikes per month to 900 bikes per month?

**Example 4.** Redo the previous example assuming the marginal cost is given by

There is no nice neat geometric way to find the area under the curve.

**Example 5.** The total cost (in dollars) of manufacturing auto body frames per week is given by



A) Find the average cost per frame if 500 frames are produced per week.

B) Find the average value of the cost function over the interval .

This is the average total cost for production levels of 0 to 500 frames per week. Geometrically, the trapezoidal area under the blue line on is equal to the rectangular area under the red line.