# Chapter 10 – 6b Differentials

**Example 5.** Given the function , find dy and ∆y when x = 8 and ∆x = 0.01.

**Example 6.** From past records, it is estimated that a company will sell N units of a product after spending x thousands of dollars on advertising:

A) Use the differential of y to approximate the increase in sales if the advertising budget increases from $10,000 to $11,000. Compare your approximation to the actual value.

B) Use the differential of y to approximate the increase in sales if the advertising budget decreases from $21,000 to $20,000. Compare your approximation to the actual value.

**Example 7.** For a company that manufactures tennis rackets, the average cost per racket is found to be

where x is the number of rackets produced per hour.

A) Use the differential of to approximate the change in the average cost per racket if production increases from 20 to 25 rackets per hour. Compare your approximation to the actual value.

B) Use the differential of to approximate the change in the average cost per racket if production decreases from 20 to 18 rackets per hour. Compare your approximation to the actual value.

Notice that the estimate provided by the differential dy is not very accurate because dx is quite large (5 and -2 respectively).