

Name:

Sec. 3.6 - Logarithmic functions

Math 251

Find the derivatives of the following functions

1. Suppose that the cost (in dollars) for a company to produce  $x$  pairs of a new line of jeans is

$$C(x) = 10000 + 5x + 0.01x^2$$

(a) Find the marginal cost function

(b) Find  $C'(500)$  and interpret the meaning.

(c) Compare  $C'(500)$  with the cost of manufacturing the 501st item.

2. The frequency of vibrations of a violin string is given by

$$f = \frac{1}{2L} \sqrt{\frac{T}{\rho}}$$

where  $L$  is the length of the string,  $T$  is its tension and  $\rho$  is its linear density. Find the rate of change of the frequency with respect to

(a) the length (when  $T$  and  $\rho$  are constant)

(b) the tension (when  $L$  and  $\rho$  are constant)

(c) the linear density (when  $L$  and  $T$  are constant)