

Problems discussed in the videos:

Video (1)

Example 1

Suppose that a certain school of economists modeled the Gross National Product of the United States at time t (measured in years from January 1, 1990) by the formula

$$f(t) = 3.4 + .04t + .13e^{-t}$$

where the Gross National Product is measured in trillions of dollars. What was the predicted percentage rate of growth (or decline) of the economy at $t = 0$ and $t = 1$?

Videos (2) – (3)

Example 2

Suppose that the value in dollars of a certain business investment at time t may be approximated empirically by the function $f(t) = 750,000e^{.6\sqrt{t}}$. Use a logarithmic derivative to describe how fast the value of the investment is increasing when $t = 5$ years.

Video (4) – (5)

Problem 21

A movie theater has a seating capacity of 3000 people. The number of people attending a show at price p dollars per ticket is $q = (18,000/p) - 1500$. Currently, the price is \$6 per ticket.

(a) Is demand elastic or inelastic at $p = 6$?

(b) If the price is lowered, will revenue increase or decrease?

Videos (6) – (7)

Problem 9

Suppose that the annual sales S (in dollars) of a company may be approximated empirically by the formula

$$S = 50,000\sqrt{e^{\sqrt{t}}},$$

where t is the number of years beyond some fixed reference date. Use a logarithmic derivative to determine the percentage rate of growth of sales at $t = 4$.