

HUNGERFORD/LIAL (GRAPHING) APPLICATIONS PROBLEMS

Chapter 14, Section 1

Management The rate of change of the number of pounds of cattle on farms in the years 1980 to 1997 can be modeled by the function

$$y = -0.0152x^3 + 0.39x^2 - 2.18x - 1.796 \quad (0 \leq x \leq 17)$$

where y is in million pounds of cattle per year and $x = 0$ represents the year 1980.

Source: U. S. Dept. of Agriculture (Statistical Abstract 1997, table #1122)

(a) Given that there were about 109.805 million pounds of cattle on farms in 1985, find a function that represents the total pounds of cattle on farms from 1980 to 1997.

(b) How many million pounds of cattle were on farms in 1992?

Chapter 14, Section 4

Management Jamestown Soup Company has found the annual revenue (in dollars) of a new soup is changing at the rate $R(t) = 3.3(t-2)(2t-.5t^2)^2$, where t is the number of months since the soup was introduced. Find the total revenue

(a) over the first two months.

(b) over the first year.

Chapter 14, Section 6

Physical Science Velocity is the rate of change of distance with respect to time—ft per sec, miles per hour, so on. Therefore, if $h(t)$ represents the distance of an object above ground, for instance, $h'(t)$ is the velocity of the object. Given that an object is projected from the ground and its height after one second is 1080 feet, find an equation for the height of the object given its velocity is

$$h'(t) = 96 - 32t.$$

HUNGERFORD/LIAL (GRAPHING) ANSWERS

Chapter 14, Section 1

(a) $f(x) = -0.0038x^4 + 0.13x^3 - 1.09x^2 - 1.796x + 132.16$

(b) About 99.49 million pounds.

Chapter 14, Section 4

(a) The revenue is $-\$8.80$ (a loss of $\$8.80$) over the first two months.

(b) The revenue is to $\$121,651$ over the first year.

Chapter 14, Section 6

$$h(t) = -16t^2 + 96t + 1000$$