

Name:

Section 3.2 - In class example

Math 151 – Spring 2019

1. Differentiate each of the following functions

(a) $P(t) = 200e^{-12t}$

$$\frac{dP}{dt} = 200 \cdot (-12)e^{-12t}$$

(b) $P(t) = 3000(1.02)^t$.

$$\frac{dP}{dt} = 3000 \cdot \ln(1.02)(1.02)^t.$$

2. The value of an automobile purchased in 2009 can be approximated by the function $V(t) = 25(0.85)^t$, where t is the time, in years, from the date of purchase, and $V(t)$ is the value, in thousands of dollars.

(a) Evaluate and interpret $V(4)$, including units.

$$V(4) = 13.05 \text{ thousand dollars}$$

(b) Find an expression for $V'(t)$, including units.

$$V'(t) = 25 \cdot \ln(0.85)(0.85)^t \text{ thousand dollars per year.}$$

(c) Evaluate and interpret $V'(4)$, including units.

$$V'(4) = -2.12 \text{ thousand dollars per year. i.e at the end of year 4, the car will lose value at a rate of } \$2,120 \text{ dollars per year}$$