

Name:

Section 3.2 - In class example

Math 151 – Spring 2018

1. Differentiate each of the following functions

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

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

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.

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

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

## Compositions of functions

1. Let  $f(t) = \ln(t)$  and  $g(t) = 3t$ . Write down the compositions  $f(g(t))$  and  $g(f(t))$ .

2. Each of the following functions are compositions of the form  $f(g(x))$ . Identify  $f(x)$  and  $g(x)$ .

(a)  $\sqrt{1 + 2e^{5t}}$

(b)  $(x^2 + 4)^3$