

# Chapter 3.6: The Chain Rule and Inverse Functions

## Calculus I

College of the Atlantic. Fall 2016

1. Take the derivative of the following functions:

(a)  $h(x) = \ln(3)$

(b)  $h(x) = \ln(3x)$

(c)  $h(x) = \ln(4x^3 + 2)$

(d)  $h(x) = \sin(3x) \ln(2x)$

(e)  $f(x) = \sin(\ln(3x))$

(f)  $g(x) = \ln(\sin(3x))$

2. Let  $g(t)$  be the number of tweets containing the hashtag #bindersfullofwomen as a function of the time  $t$  (in hours) since the end of the second presidential debate. Suppose that

$$g(t) = 1000e^{0.15t} . \tag{1}$$

(a) What is the number of #bindersfullofwomen tweets 5 hours after the debate?

(b) What is the growth rate in the number of tweets 5 hours after the debate?

(c) What is the percentage growth rate in the number of tweets 5 hours after the debate?

3. Let  $f(x) = \sin(3x)$ . Determine  $f'(4)$  two different ways:

(a) Use difference quotients and your calculator.

(b) Use the shortcut for  $\sin(x)$  and the chain rule.