

MT 1800 Calculus I
Worksheet 3.4 – The Chain Rule

- Purpose: To practice using the chain rule to compute derivatives.
- Procedure: Work in groups of two to four to complete the worksheet.

Chain Rule: $\frac{d}{dx} f(g(x)) = f'(g(x)) \cdot g'(x)$

For each function listed below, identify the inside and outside functions. Do not compute the derivatives at this time.

1. $h(x) = (2x^2 + 4)^{-3}$

outside function $f(x) =$ _____ inside function $g(x) =$ _____

$h'(x) =$ _____

2. $h(x) = \sqrt{e^x + 1}$

outside function $f(x) =$ _____ inside function $g(x) =$ _____

$h'(x) =$ _____

3. $h(t) = (3\sqrt{t} + 5)^{100}$

outside function $f(t) =$ _____ inside function $g(t) =$ _____

$h'(t) =$ _____

4. Position function $s(t) = e^{5t+4}$

outside function $f(t) =$ _____ inside function $g(t) =$ _____

$v(t) =$ _____

5. $h(x) = e^{x^2}$

outside function $f(x) =$ _____

inside function $g(x) =$ _____

$h'(x) =$ _____

6. $h(x) = 5^{7x}$

outside function $f(x) =$ _____

inside function $g(x) =$ _____

$h'(x) =$ _____

7. $h(x) = (x^2 + 3x)^5$

outside function $f(x) =$ _____

inside function $g(x) =$ _____

$h'(x) =$ _____

$h''(x) =$ _____