

SECTION 3.4 CHAIN RULE

1. For each function below, write it as a nontrivial composition of functions in the form $f(g(x))$.

(a) $H(x) = \sqrt[3]{4 - 2x}$

(b) $H(x) = \tan(2 - x^4)$

(c) $H(x) = e^{2-2x^3}$

(d) $H(x) = \frac{4}{x + \sin(x)}$

2. Complete the Chain Rule (using both types of notation)

• If $F(x) = f(g(x))$,

then $F'(x) =$

• If $y = f(u)$ and $u = g(x)$,

then $\frac{dy}{dx} =$

3. Return to problem 1 above and find the derivatives.

4. For each problem below, find the derivative.

(a) $z(t) = (2x^3 - 5x)^7$

(b) $x(\theta) = \cos^3(\theta)$

(c) $y = x^2 - 3 \sin(x^3)$

(d) $y = 10e^{\sqrt{x}}$

(e) $f(x) = \frac{\sqrt{2}}{\sqrt{x^2 - 4}}$

(f) $g(x) = \frac{\sec(x^2 + 2)}{12}$

(g) $k(s) = \frac{A^2}{B + Cs}$