

Ch. 2.4 Notes: The Chain Rule

Chain Rule: Method of computing the derivative of the composition of 2 or more functions (function within a function)

$$* \text{ Rule: } \frac{d}{dx}[f(g(x))] = f'(g(x)) \cdot g'(x)$$

Steps:

- 1) Take the derivative of the outside while keeping the inside portion unchanged
- 2) Then multiply by the derivative of the inside function.

$$\boxed{\text{Ex. 1}} \quad f(x) = (3x^2 + 2)^5$$

$$f'(x) =$$

$\boxed{\text{Ex. 2}}$ Find all values of x of $f(x) = \sqrt[3]{(x^2-1)^2}$ for which $f'(x) = 0$ and where $f'(x)$ does not exist

Ex. 3

$$y = \frac{4}{(x+2)^2}$$

find equation of tangent line to y at $x = -3$

Ex. 4

$$y = \left(\frac{x-1}{x^2-4} \right)^3$$

Ex. 5

$$y = \frac{x}{\sqrt{x^2-1}}$$