

- Chain Rule: is used when you take a derivative of a function “inside” of another function.

$$\frac{d}{dx}[f[g(x)]] =$$

$\frac{d}{dx}[f(g(x))] =$ $\frac{d}{dx}[f(AT)] =$ <p><i>AT = Anything</i></p>

Example 1: $f(x) = (2x + 3)^2$

A. Find $f'(x)$ the old way.

B. Find $f'(x)$ using the Chain Rule

Example 2: $f(x) = (3x^2 + 4x + 5)^{10}$

Find $f'(x)$

Example(s) 3:

A. $f(x) = \sqrt{x}$

B. $f(x) = \sqrt{2x + 3}$

C. $f(x) = \sqrt{\sin x}$

D. $f(x) = \sqrt{2x \cos x}$

Example(s) 4:

A. $f(x) = \sec x$

B. $f(x) = \sec(3x + 4)$

Example 5: $f(x) = (3x + 4)^5(2x + 1)^4$

Example 6: $f(x) = (4x + 5)^{\frac{5}{2}}(2x - 3)^{\frac{7}{2}}$

Example(s) 7: Find the derivative of each.

A. $f(x) = e^x$

B. $f(x) = e^{3x}$

C. $f(x) = e^{x^2+4x+5}$

D. $f(x) = e^{-x}$

E. $f(x) = \sin(2x + 4)e^{3x-4}$