

AP Calculus  
Unit 3 – Rules of Differentiation

**Day 3 Notes: Finding the Derivative of a Composite Function**

**Chain Rule of Differentiation of Composite Functions**

Find the derivative of each of the following functions by applying the chain rule.

$$f(x) = (3x^2 + 2)^3$$

$$h(x) = \sqrt[3]{(x+2)^2}$$

$$F(x) = 5\sqrt[3]{x^2 + 2x}$$

$$h(x) = \sin^2(2x+1)$$

Now that you know “**THE BIG THREE**” rules of differentiation—product, quotient, and chain—let’s see how the three can be incorporated with each other. Find the derivative of each of the following functions.

$$f(x) = 5x\sqrt{x+3}$$

$$g(x) = \sin\left(\frac{2x+1}{x-3}\right)$$

$$h(x) = \frac{\sqrt{2x+5}}{x-3}$$