

MATH 1325
Chapter 11.7: The Chain Rule

$$y = x^N$$

$$y = [f(x)]^N$$

FIND THE DERIVATIVE.

$$y = x^2$$

$$y = (2x + 5)^2$$

$$y = (3x^2 + 5x + 1)^4$$

COMPOSITE FUNCTION

$$g \circ f = g[f(x)]$$

$$f \circ g = f[g(x)]$$

IF $f(x) = 2x - 1$ AND $g(x) = \sqrt{3x + 5}$, FIND THE FOLLOWING.

$$(g \circ f)(4)$$

$$(f \circ g)(4)$$

$$(f \circ g)(-2)$$

IF $f(x) = 4x + 1$ AND $g(x) = 2x^2 + 5x$, FIND THE FOLLOWING.

$$(f \circ g)(x)$$

$$(g \circ f)(x)$$

FIND THE DERIVATIVE.

$$y = \sqrt{15x^2 + 1}$$

$$y = (3x^2 - 5x)^7$$

$$y = (3 + 5x)^2$$

$$y = 2(7x^2 + 5)^4$$

FIND THE DERIVATIVE.

$$y = 4x(3x+5)^5$$

$$y = \frac{(3x+2)^3}{x-1}$$

$$y = \frac{3x-7}{5x+1}$$

$$y = (3x-7)(5x+1)^{-1}$$

A BANK ACCOUNT OPENS WITH \$20000 AND THE INTEREST RATE R IS COMPOUNDED MONTHLY. AT THE END OF 18 YEARS, THE BALANCE IS GIVEN BY THE EQUATION.

$$A = (20000) \left(1 + \frac{R}{1200} \right)^{216}$$

FIND THE RATE OF CHANGE OF A WITH RESPECT TO R WHEN $R = 1.5$, $R = 2.5$, AND $R = 3$.

$$\text{MARGINAL REVENUE PRODUCT: } \frac{\partial R}{\partial N} = \left(P + X \cdot \frac{\partial P}{\partial X} \right) \frac{\partial X}{\partial N}$$

REVENUE FROM X UNITS AT PRICE P PER UNIT

$$R = PX$$

FIND AND INTERPRET THE MARGINAL REVENUE PRODUCT $\frac{\partial R}{\partial N}$
IN DOLLARS PER EMPLOYEE WHEN $N=20$ IF $P = \frac{600}{\sqrt{X}}$ AND $X = 5N$.