Name: _____ Date: _____

Learning Goal 3.1	Using all basic derivative rules.

Example Differentiate the following in two ways – multiplying first and multiplying during.

a. $y = 3x^2(4x)$

b. $y = \dfrac{6x^5}{2x^3}$

The Product Rule

Example Find the derivative using the product rule.

a. $y = 3x^2(4x)$

b. $f(x) = \sqrt[3]{x^2}(2x - x^2)$

The Quotient Rule

Example Find the derivative using the quotient rule.

a. $y = \frac{6x^5}{2x^3}$

b. $p(t) = \frac{3t + 9}{2 - t}$

Example Suppose that the volume of air in a balloon at time t seconds, is given by the formula

$$v(t) = \frac{6\sqrt{t}}{4t + 1}$$

Determine if the balloon is being filled with or is losing air when $t = 8$ seconds.