1. Chapter 3 Section 3: Formulas - The Product and Quotient Rules

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

(2) $\dfrac{d}{dx}\left[\dfrac{f(x)}{g(x)}\right] =$

2. Examples

Example 2.1. *Find* $g'(x)$ *if* $g(x) = 2e^x(3x^2 - x - 1)$.

Example 2.2. *Where does* $g(x) = 2e^x(3x^2 - x - 1)$ *have horizontal tangent lines? Use Example 2.1.*

Example 2.3. *Where is* $g(x) = 2e^x(3x^2 - x - 1)$ *increasing? Use Example 2.2.*

Example 2.4. *Find the derivative of* $f(x) = \dfrac{x}{x^2 + 3}$.

Example 2.5 (3.3 Text 18)**.** *Find the derivative of* $f(x) = \dfrac{x^2 + 3}{x}$.

Example 2.6 (3.3 Text 50)**.** *The functions f and g are differentiable functions. Find the derivative of $\dfrac{f(x)}{g(x)+1}$ using $f(x)$ and $f'(x)$ in your answers as necessary.*

Example 2.7. *Find $h'(-2)$ where $h(x) = \dfrac{f(x)}{g(x)+1}$ given the values in the table. Hint: use example 2.6.*

x	$f(x)$	$g(x)$	$f'(x)$	$g'(x)$
-2	-4	2	3	5