2.4 The Quotient Rule

Theorem

Given two differentiable functions $f(x)$ and $g(x)$, **then** the quotient function

$$h(x)=\frac{f(x)}{g(x)}$$

is also differentiable, and

$$h'(x)=\frac{f'(x)g(x)-f(x)g'(x)}{\left[g(x)\right]^2}$$

Proof

Example 2.4.1

Differentiate using the Quotient Rule, simplifying as much as possible.

$$f(x)=\frac{5x-2}{x+1}$$

Example 2.4.2

Differentiate, and simplify.

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

Example 2.4.3

Differentiate and simplify.

$$g(t)=\frac{\sqrt{t}}{2t^2+3}$$

Example 2.4.4

Differentiate and simplify.

$$h(x) = \frac{\left(4x^2 - 5\right)^3}{\sqrt{x}}$$

Example 2.4.5

From your text, Pg. 97 #7

Example 2.4.6

From your text, Pg. 97 #5d

Class/Homework for Section 2.4

Pg. 97 – 98 #2, 4 – 6, 8 – 13, 15