

2.5 The Quotient Rule

Some rational functions can be simplified to allow use of the Power Rule when finding the derivative.

$$\text{Ex. } y = \frac{x^3 + 1}{x + 1}$$

But other rational functions are not easy (or even possible) to simplify to allow use of the Power Rule. Thus, we need another rule!

Quotient Rule

If both f and g are differentiable, then so is the quotient $F(x) = \frac{f(x)}{g(x)}$ and

$$F'(x) =$$

$$\frac{d}{dx} \left(\frac{f(x)}{g(x)} \right) =$$

Find $F'(x)$ if $F(x) = \frac{x^2 + 2x - 3}{x^3 + 1}$

Find $\frac{dy}{dx}$ if $y = \frac{\sqrt{x}}{1+2x}$

Differentiate: $f(x) = \frac{2x^3 - \sqrt{x} - 1}{x}$