

IV.B4 Quotient Rule

Purpose

The purpose of the product rule is to differentiate a function that can be broken down into two other functions where one is dividing the other.

Basic Form

if

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

then

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

Example

$$h(x) = \frac{(x-1)}{(2x+3)} \quad \begin{array}{ll} f(x) = x-1 & g(x) = 2x+3 \\ f'(x) = 1 & g'(x) = 2 \end{array}$$

so

$$h'(x) = \frac{1(2x+3) - 2(x-1)}{(2x+3)(2x+3)}$$

or

$$h'(x) = \frac{(2x+3) - (2x-2)}{(2x+3)(2x+3)}$$

or

$$h'(x) = \frac{5}{(2x+3)^2}$$

