

The Product Rule

Lecture 15
Section 2.3

Robb T. Koether

Hampden-Sydney College

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Objectives

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- The Product Rule.
- The Quotient Rule.

The Product Rule

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Let $f(x)$ and $g(x)$ be functions. Then

$$\frac{d}{dx}(f(x)g(x)) = f'(x)g(x) + f(x)g'(x).$$

Example 2.3.3

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A manufacturer determines that t months after a new product is introduced to the market, $x(t) = t^2 + 3t$ hundred units can be produced and then sold at a price of $p(t) = -2t^{3/2} + 30$ dollars per unit.

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- At what rate is revenue changing with respect to time?

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- (a) Express revenue $R(t)$ as a function of time.
- (b) At what rate is revenue changing with respect to time?
- (c) At 4 months after a product is introduced, is revenue increasing or is it decreasing?