1.4 The Quotient Rule Lesson

This document was composed and formatted by Annie Bernatchez.

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The Quotient Rule:

If $h(x) = \frac{f(x)}{g(x)}$, then $h'(x) = \frac{f'(x)g(x) - g'(x)f(x)}{[g(x)]^2}$

Proof:

Example 1: Find the derivative of each of the following:

a) $f(x) = \frac{3x - 4}{x^2 + 5}$

b) $g(x) = \frac{6x - 5}{x^3 + 4}$

c) $h(x) = \frac{2x + 8}{\sqrt{x}}$

d) $r(x) = \frac{x + 3}{\sqrt{x^2 - 1}}$

Note: $\frac{d}{dx}\sqrt{x^2 - 1}$ *from part d) uses the 'chain rule'. We will learn this in depth in the next lesson.*

Example 2: Determine an equation for the tangent to the curve $y = \frac{x^2 - 3}{5 - x}$ at $x = 2$.

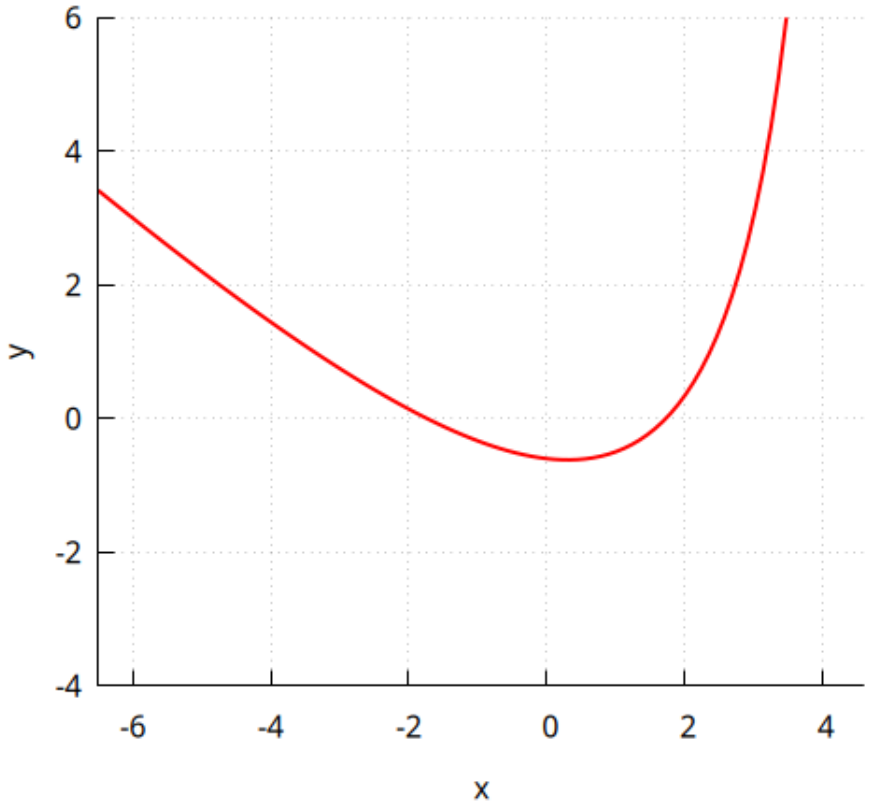
Point on Tangent Line:

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Slope of tangent line:

Equation of tangent line:

$$y = mx + b$$



Example 3: Determine the coordinates of each point on the graph of $h(x) = \frac{2x + 8}{\sqrt{x}}$ where the tangent is horizontal.

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