

Problem Definition

Problem 11. Find the derivative of the following function at the given point.

$$g(x) = \frac{2x + 1}{x - 5} \quad (6, 13)$$

Solution Step 1:

In this case, we have a quotient of two polynomials. So, we can use the quotient rule to compute the derivative. The general formula can be written as

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

For our problem, we compute the derivative as follows.

$$\begin{aligned} g(x) &= \frac{d}{dx} \frac{f(x)}{h(x)} \\ &= \frac{2x + 1}{x - 5} \\ &= \frac{2(x - 5) - (2x + 1)(1)}{(x - 5)^2} \\ &= \frac{2x - 10 - 2x - 1}{(x - 5)^2} \\ &= \frac{9}{(x - 5)^2} \end{aligned}$$

This comes from

$$f(x) = 2x + 1$$

and

$$h(x) = x - 5$$

for the general formula above.