

Combining Rules

Sometimes we have functions that are combinations of products, quotients and compositions all at the same time.

Example 1: Differentiate the function.

$$f(x) = \left(\frac{9-x}{x^2-1} \right)^2$$

Example 2: Differentiate the function.

$$f(x) = \frac{\sqrt{4-3x}}{\sin x}$$

Example 3: Differentiate the function.

$$f(x) = (x^2 - 2x + 7)^3 \cos^4(2x)$$

Practice!

Find the derivative of each function below.

$$f(x) = (-x^3 + 3)^{-3}(x + 5)$$

$$f(x) = \frac{-3x^2 + 1}{(x + 4)^3}$$

$$f(x) = \frac{(5x - 4)^{\frac{1}{4}}}{x^3 + 2}$$

$$f(x) = \cos\left(\frac{x^3}{2x^5 + 3}\right)$$

$$f(x) = \sin(2x^4) \cdot (x^2 + 5)$$