Problem Definition

Problem 49. Compute the derivative of the function.

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

Solution Step 1:

First, we can rewrite the function so that we can use the generalized power rule. The rewrite looks like the following.

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

Solution Step 2:

Next we compute the derivative of the function using the generalized power rule and simplify

$$\begin{aligned} f'(x) &= \frac{d}{dx}(x^2 - 3x)^{-2} \\ &= (-2)(x^2 - 3x)^{-3}\frac{d}{dx}(x^2 - 3x) \\ &= (-2)(x^2 - 3x)^{-3}(2x - 3) \\ &= -\frac{2(2x - 3)}{(x^2 - 3x)^3} \end{aligned}$$

which is the solution in the back of the textbook.