

Problem Definition

Problem 31. Use the General Power Rule to find the derivative of the function.

$$f(x) = -3\sqrt[4]{2 - 9x}$$

Solution Step 1:

Applying the power rule gives

$$\begin{aligned} f'(x) &= \frac{d}{dx} \left(-3\sqrt[4]{2 - 9x} \right) \\ &= -3 \frac{d}{dx} (2 - 9x)^{\frac{1}{4}} \\ &= -3 \left(\frac{1}{4} \right) (2 - 9x)^{-\frac{3}{4}} \frac{d}{dx} (2 - 9x) \\ &= -\frac{3}{4} (2 - 9x)^{-\frac{3}{4}} (-9) \\ &= -\frac{27}{4} (2 - 9x)^{-\frac{3}{4}} \\ &= -\frac{27}{4(2 - 9x)^{\frac{3}{4}}} \end{aligned}$$

where the solution has been simplified to obtain the solution in the book.