

Problem Definition

Problem 17. Find the derivative of the following function.

$$f(x) = 4\sqrt{x}$$

Solution Step 1:

The first step is to write the function as a power. This can be done as follows.

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

Solution Step 2:

The next step is to compute the derivative using the power rule. The derivative of the function is given by the following calculations.

$$f'(x) = \frac{d}{dx}(4x^{\frac{1}{2}}) = 4 \frac{d}{dx} x^{\frac{1}{2}} = 4\left(\frac{1}{2} x^{-\frac{1}{2}}\right) = \frac{2}{\sqrt{x}}$$

Solution Step 3:

In some cases you may need to rationalize the denominator. To be complete on this problem we will do that extra step. Using the result from above we obtain the form given below.

$$f'(x) = \frac{\sqrt{x}}{\sqrt{x}} \frac{2}{\sqrt{x}} = \frac{2\sqrt{x}}{x}$$