Exercise 21

Differentiate.

$$f(t) = \frac{\sqrt[3]{t}}{t - 3}$$

Solution

Use the quotient rule to differentiate $f(t)$.

$$f'(t) = \frac{d}{dt}\left(\frac{t^{1/3}}{t - 3}\right)$$

$$= \frac{\left[\frac{d}{dt}(t^{1/3})\right](t - 3) - \left[\frac{d}{dt}(t - 3)\right](t^{1/3})}{(t - 3)^2}$$

$$= \frac{\left(\frac{1}{3}t^{-2/3}\right)(t - 3) - (1)(t^{1/3})}{(t - 3)^2}$$

$$= \frac{\frac{1}{3}t^{1/3} - t^{-2/3} - t^{1/3}}{(t - 3)^2}$$

$$= \frac{-\frac{2}{3}t^{1/3} - t^{-2/3}}{(t - 3)^2}$$