Exercise 74

Find f' in terms of g'.

$$f(x) = g(g(x))$$

Solution

Calculate $f'(x)$ by using the chain rule.

$$\begin{aligned} f'(x) &= \frac{d}{dx}[g(g(x))] \\ &= g'(g(x)) \cdot \left[\frac{d}{dx}g(x)\right] \\ &= g'(g(x)) \cdot g'(x) \\ &= g'(g(x))g'(x) \end{aligned}$$