

Exercise 71

Find f' in terms of g' .

$$f(x) = x^2g(x)$$

Solution

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

$$\begin{aligned} f'(x) &= \frac{d}{dx}[x^2g(x)] \\ &= \left[\frac{d}{dx}(x^2) \right] g(x) + x^2 \left[\frac{d}{dx}g(x) \right] \\ &= (2x)g(x) + x^2g'(x) \\ &= 2xg(x) + x^2g'(x) \end{aligned}$$