

Exercise 3

Differentiate.

$$f(x) = e^x \cos x$$

Solution

Use the product rule to differentiate $f(x)$.

$$\begin{aligned} f'(x) &= \frac{d}{dx}[f(x)] \\ &= \frac{d}{dx}(e^x \cos x) \\ &= \left[\frac{d}{dx}(e^x) \right] \cos x + e^x \left[\frac{d}{dx}(\cos x) \right] \\ &= (e^x) \cos x + e^x(-\sin x) \\ &= (\cos x - \sin x)e^x \end{aligned}$$