

Exercise 32

Calculate y' .

$$y = e^{\cos x} + \cos(e^x)$$

Solution

Calculate y' by using the chain rule.

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