

**Exercise 7**

Differentiate the function.

$$f(x) = \log_{10}(1 + \cos x)$$

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**Solution**

Take the derivative of the function using the chain rule.

$$\begin{aligned} f'(x) &= \frac{d}{dx} [\log_{10}(1 + \cos x)] \\ &= \frac{1}{(1 + \cos x) \ln 10} \cdot \frac{d}{dx} (1 + \cos x) \\ &= \frac{1}{(1 + \cos x) \ln 10} \cdot (-\sin x) \\ &= -\frac{\sin x}{(1 + \cos x) \ln 10} \end{aligned}$$