

Exercise 4

Calculate y' .

$$y = \frac{\tan x}{1 + \cos x}$$

Solution

Calculate y' by using the quotient rule.

$$\begin{aligned} y' &= \frac{d}{dx} \left(\frac{\tan x}{1 + \cos x} \right) \\ &= \frac{\left[\frac{d}{dx}(\tan x) \right] (1 + \cos x) - \left[\frac{d}{dx}(1 + \cos x) \right] (\tan x)}{(1 + \cos x)^2} \\ &= \frac{(\sec^2 x)(1 + \cos x) - (-\sin x)(\tan x)}{(1 + \cos x)^2} \\ &= \frac{\sec^2 x + \sec x + \sin x \tan x}{(1 + \cos x)^2} \end{aligned}$$