

**Exercise 23**

Find the derivative of the function.

$$y = e^{\tan \theta}$$

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**Solution**

Take the derivative using the chain rule.

$$\begin{aligned} y' &= \frac{dy}{d\theta} = \frac{d}{d\theta}(e^{\tan \theta}) \\ &= e^{\tan \theta} \cdot \frac{d}{d\theta}(\tan \theta) \\ &= e^{\tan \theta} \cdot (\sec^2 \theta) \\ &= e^{\tan \theta} \sec^2 \theta \end{aligned}$$