

Exercise 39

Calculate y' .

$$y = \tan^2(\sin \theta)$$

Solution

Calculate y' by using the chain rule.

$$\begin{aligned} y' &= \frac{d}{d\theta} \tan^2(\sin \theta) \\ &= \frac{d}{d\theta} [\tan(\sin \theta)]^2 \\ &= 2[\tan(\sin \theta)]^1 \cdot \frac{d}{d\theta} [\tan(\sin \theta)] \\ &= 2 \tan(\sin \theta) \cdot \sec^2(\sin \theta) \cdot \frac{d}{d\theta} (\sin \theta) \\ &= 2 \tan(\sin \theta) \cdot \sec^2(\sin \theta) \cdot (\cos \theta) \\ &= 2 \tan(\sin \theta) \sec^2(\sin \theta) \cos \theta \end{aligned}$$