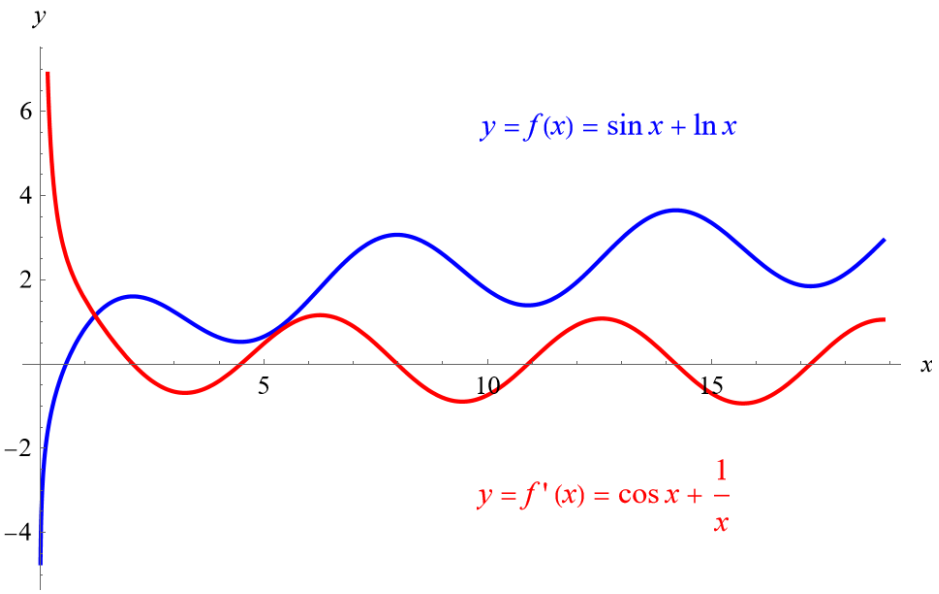
Exercise 35

If $f(x) = \sin x + \ln x$, find $f'(x)$. Check that your answer is reasonable by comparing the graphs of f and f'.

Solution

Take the derivative of the function with respect to x.

$$\begin{aligned} f'(x) &= \frac{d}{dx}(\sin x + \ln x) \\ &= \frac{d}{dx}(\sin x) + \frac{d}{dx}(\ln x) \\ &= (\cos x) + \left(\frac{1}{x}\right) \\ &= \cos x + \frac{1}{x} \end{aligned}$$



Notice that wherever the tangent line to $y = f(x)$ is horizontal, $y = f'(x)$ is zero.