

Exercise 2

Differentiate.

$$f(x) = x \cos x + 2 \tan x$$

SolutionUse the product rule to differentiate $f(x)$.

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