

§ 3.4 いくつかの関数の導関数

問題 3.4.1

$$\begin{aligned} f'(x) &= \frac{d}{dx}(x^3 \tan x) = \frac{d}{dx}x^3 \cdot \tan x + x^3 + \frac{d}{dx} \tan x = 3x^2 \tan x + x^3 \sec^2 x \\ &= x^2(3 \tan x + x \sec^2 x) . \end{aligned}$$

問題 3.4.2

$$\begin{aligned} \frac{dx}{dt} &= \frac{d \tan t}{dt t^3} = \frac{\frac{d}{dt} \tan t \cdot t^3 - \tan t \frac{d}{dt} t^3}{(t^3)^2} = \frac{\sec^2 t \cdot t^3 - \tan t \cdot 3t^2}{t^6} \\ &= \frac{t \sec^2 t - 3 \tan t}{t^4} . \end{aligned}$$

問題 3.4.3

$$g'(x) = \frac{d}{dx} \frac{3}{2x^4} = \frac{3}{2} \frac{d}{dx} x^{-4} = \frac{3}{2} \cdot (-4)x^{-5} = -\frac{6}{x^5} .$$