

### 1.3 関数の積・商の微分

関数  $f(x), g(x)$  の積  $f(x)g(x)$  や, 商  $f(x)/g(x)$  は次の公式を用いて微分する.

積と商の微分

- $\{f(x)g(x)\}' = f'(x)g(x) + f(x)g'(x)$
- $\left\{\frac{1}{g(x)}\right\}' = -\frac{g'(x)}{g(x)^2}$
- $\left\{\frac{f(x)}{g(x)}\right\}' = \frac{f'(x)g(x) - f(x)g'(x)}{g(x)^2}$

問題 1.2. (1)  $y = x \cos x$

(4)  $y = \frac{1}{x+1}$

(7)  $y = \frac{x}{x^2+1}$

(2)  $y = x \log x$

(5)  $y = \frac{1}{\sin x}$

(8)  $y = \frac{\cos x}{x}$

(3)  $y = \frac{1}{x}$

(6)  $y = \frac{1}{e^x+1}$

問題 1.3. (1)  $y = \cos x + x \sin x$

(5)  $y = \frac{e^x}{e^x+1}$

(2)  $y = e^x(\sin x - \cos x)$

(6)  $y = \frac{\log x}{x}$

(3)  $y = x^3(3 \log x - 1)$

(7)  $y = \frac{\log x - 1}{\log x + 1}$

(4)  $y = \frac{\sin x}{1 + \cos x}$