

微積分解法 2016

レポート3回目

①

問 微分を求めよ.

$$f(x) = \log \sqrt{\frac{1+\cos x}{1-\cos x}}$$

$$g(x) = x \sqrt{x^2+2}$$

$$f'(x) = \frac{\boxed{(1)}}{\sin x}$$

$$g'(x) = \boxed{(2)} \times \frac{x^2+1}{\sqrt{x^2+2}}$$

$$\boxed{(1)} = -1$$

$$\boxed{(2)} = 2$$

$$f(x) = \frac{1}{2} \log(1 + \cos x) - \frac{1}{2} \log(1 - \cos x)$$

$$f'(x) = \frac{1}{2} \frac{-\sin x}{1 + \cos x} - \frac{1}{2} \frac{\sin x}{1 - \cos x}$$

$$= \frac{1}{2} \frac{\sin x \{-(1 - \cos x) - (1 + \cos x)\}}{(1 + \cos x)(1 - \cos x)}$$

$$= \frac{-2 \sin x}{2(1 - \cos^2 x)} = -\frac{\sin x}{\sin^2 x} = \underline{\underline{-\frac{1}{\sin x}}}$$

$$g'(x) = \sqrt{x^2 + 2} + x \cdot \frac{1}{2} \frac{2x}{\sqrt{x^2 + 2}}$$

$$= \frac{x^2 + 2 + x^2}{\sqrt{x^2 + 2}}$$

$$= \underline{\underline{2 \frac{x^2 + 1}{\sqrt{x^2 + 2}}}}$$