



次の式を微分しなさい。

(1)  $y = \sin(2\sqrt{x} + 1)$

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

(3)  $y = \cos^2\left(2x - \frac{\pi}{4}\right)$

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

(1)  $y' = \cos(2\sqrt{x} + 1)(2x^{\frac{1}{2}} + 1)'$

$$y' = \frac{\cos(2\sqrt{x} + 1)}{\sqrt{x}}$$

(2)  $y' = 2\sin x \cos x \cos 2x + \sin^2 x \cdot -\sin 2x \cdot 2$

$$y' = \frac{2\sin x \cos^2 x \cdot \cos 2x}{\sin 2x} - \frac{2\sin^2 x \sin 2x}{1 - \cos 2x}$$

$$y' = \sin 2x \cos 2x - (1 - \cos 2x) \sin 2x$$

$$= \sin 2x \cos 2x - \sin 2x + \sin 2x \cos 2x$$

$$= \frac{2\sin 2x \cos 2x}{\sin 4x} - \sin 2x$$

$$y' = \frac{\sin 4x - \sin 2x}{1}$$

(3)  $y' = 2\cos\left(2x - \frac{\pi}{4}\right) \left\{ \cos\left(2x - \frac{\pi}{4}\right) \right\}'$

$$= 2\cos\left(2x - \frac{\pi}{4}\right) \cdot -2\sin\left(2x - \frac{\pi}{4}\right)$$

$$= -2 \cdot 2 \sin\left(2x - \frac{\pi}{4}\right) \cos\left(2x - \frac{\pi}{4}\right)$$

$$\sin\left\{2\left(2x - \frac{\pi}{4}\right)\right\}$$

$$= -2\sin\left(4x - \frac{\pi}{2}\right)$$

$$= 2\sin\left(\frac{\pi}{2} - 4x\right) = 2\cos 4x$$

$$y' = 2\cos 4x$$

(4)

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

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

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$$y' = \frac{1}{1 - \sin x}$$

