

反射テスト 三角関数 加法定理 02

1. 引数の $()$ を外す計算をせよ. (S 級 1 分 30 秒, A 級 2 分 30 秒, B 級 4 分, C 級 6 分)

(1) $\sin\left(x + \frac{\pi}{3}\right)$

(2) $\cos\left(x + \frac{\pi}{4}\right)$

(3) $\sin\left(x - \frac{\pi}{6}\right)$

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

2. 引数の()を外す計算をせよ。(S級1分30秒, A級2分30秒, B級4分, C級6分)

(1) $\sin\left(x + \frac{3}{4}\pi\right)$

(2) $\cos\left(x + \frac{\pi}{6}\right)$

(3) $\sin\left(x - \frac{7}{6}\pi\right)$

(4) $\cos\left(x - \frac{5}{3}\pi\right)$

反射テスト 三角関数 加法定理 02 解答解説

1. 引数の()を外す計算をせよ。(S級1分30秒, A級2分30秒, B級4分, C級6分)

★ 加法定理

$$\sin(\alpha \pm \beta) = \sin \alpha \cos \beta \pm \cos \alpha \sin \beta$$

信号そのまま行進

$$\cos(\alpha \pm \beta) = \cos \alpha \cos \beta \mp \sin \alpha \sin \beta$$

ここで 逆転シメシメ

$$(1) \quad \sin\left(x + \frac{\pi}{3}\right)$$

$$= \sin x \cos \frac{\pi}{3} + \cos x \sin \frac{\pi}{3}$$

$$= \sin x \cdot \frac{1}{2} + \cos x \cdot \frac{\sqrt{3}}{2}$$

$$= \frac{1}{2} \sin x + \frac{\sqrt{3}}{2} \cos x$$

$$(2) \quad \cos\left(x + \frac{\pi}{4}\right)$$

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

$$= \cos x \cdot \frac{1}{\sqrt{2}} - \sin x \cdot \frac{1}{\sqrt{2}}$$

$$= \frac{1}{\sqrt{2}} \cos x - \frac{1}{\sqrt{2}} \sin x$$

$$(3) \quad \sin\left(x - \frac{\pi}{6}\right)$$

$$= \sin x \cos \frac{\pi}{6} - \cos x \sin \frac{\pi}{6}$$

$$= \sin x \cdot \frac{\sqrt{3}}{2} - \cos x \cdot \frac{1}{2}$$

$$= \frac{\sqrt{3}}{2} \sin x - \frac{1}{2} \cos x$$

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

$$= \cos x \cos \frac{2}{3}\pi + \sin x \sin \frac{2}{3}\pi$$

$$= \cos x \cdot \left(-\frac{1}{2}\right) + \sin x \cdot \frac{\sqrt{3}}{2}$$

$$= -\frac{1}{2} \cos x + \frac{\sqrt{3}}{2} \sin x$$

2. 引数の()を外す計算をせよ。(S級1分30秒, A級2分30秒, B級4分, C級6分)

$$(1) \quad \sin\left(x + \frac{3}{4}\pi\right)$$

$$= \sin x \cos \frac{3}{4}\pi + \cos x \sin \frac{3}{4}\pi$$

$$= \sin x \cdot \left(-\frac{1}{\sqrt{2}}\right) + \cos x \cdot \frac{1}{\sqrt{2}}$$

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

$$(2) \quad \cos\left(x + \frac{\pi}{6}\right)$$

$$= \cos x \cos \frac{\pi}{6} - \sin x \sin \frac{\pi}{6}$$

$$= \cos x \cdot \frac{\sqrt{3}}{2} - \sin x \cdot \frac{1}{2}$$

$$= \frac{\sqrt{3}}{2} \cos x - \frac{1}{2} \sin x$$

$$(3) \quad \sin\left(x - \frac{7}{6}\pi\right)$$

$$= \sin x \cos \frac{7}{6}\pi - \cos x \sin \frac{7}{6}\pi$$

$$= \sin x \cdot \left(-\frac{\sqrt{3}}{2}\right) - \cos x \cdot \left(-\frac{1}{2}\right)$$

$$= -\frac{\sqrt{3}}{2} \sin x + \frac{1}{2} \cos x$$

$$(4) \quad \cos\left(x - \frac{5}{3}\pi\right)$$

$$= \cos x \cos \frac{5}{3}\pi + \sin x \sin \frac{5}{3}\pi$$

$$= \cos x \cdot \frac{1}{2} + \sin x \cdot \left(-\frac{\sqrt{3}}{2}\right)$$

$$= \frac{1}{2} \cos x - \frac{\sqrt{3}}{2} \sin x$$