

積を和・差になおす公式

$$\begin{aligned} \boxed{1} \quad \sin \alpha \cos \beta &= \frac{1}{2} \{ \sin(\alpha + \beta) + \sin(\alpha - \beta) \} \\ \boxed{2} \quad \cos \alpha \sin \beta &= \frac{1}{2} \{ \sin(\alpha + \beta) - \sin(\alpha - \beta) \} \\ \boxed{3} \quad \cos \alpha \cos \beta &= \frac{1}{2} \{ \cos(\alpha + \beta) + \cos(\alpha - \beta) \} \\ \boxed{4} \quad \sin \alpha \sin \beta &= -\frac{1}{2} \{ \cos(\alpha + \beta) - \cos(\alpha - \beta) \} \end{aligned}$$

正弦・余弦の加法定理

$$\begin{aligned} \boxed{1} \quad \sin(\alpha \pm \beta) &= \sin \alpha \cos \beta \pm \cos \alpha \sin \beta \\ \boxed{2} \quad \cos(\alpha \pm \beta) &= \cos \alpha \cos \beta \mp \sin \alpha \sin \beta \end{aligned}$$

$$\boxed{1} \quad \sin \alpha \cos \beta = \frac{1}{2} \{ \sin(\alpha + \beta) + \sin(\alpha - \beta) \}$$

$$\begin{aligned} \sin(\alpha + \beta) &= \sin \alpha \cos \beta + \cos \alpha \sin \beta \\ +) \sin(\alpha - \beta) &= \sin \alpha \cos \beta - \cos \alpha \sin \beta \\ \hline \end{aligned}$$

$$\sin(\alpha + \beta) + \sin(\alpha - \beta) = 2 \sin \alpha \cos \beta$$

$$\boxed{3} \quad \cos \alpha \cos \beta = \frac{1}{2} \{ \cos(\alpha + \beta) + \cos(\alpha - \beta) \}$$

$$\begin{aligned} \cos(\alpha + \beta) &= \cos \alpha \cos \beta - \sin \alpha \sin \beta \\ +) \cos(\alpha - \beta) &= \cos \alpha \cos \beta + \sin \alpha \sin \beta \\ \hline \end{aligned}$$

$$\cos(\alpha + \beta) + \cos(\alpha - \beta) = 2 \cos \alpha \cos \beta$$

例 1 次の等式を証明せよ。

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

問 1 次の等式を証明せよ。

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

例 2

次の式を 2 つの三角関数の和か差の形になおせ。

$$\cos 3x \cdot \sin x$$

答 $\cos 3x \cdot \sin x =$

問 2

次の式を 2 つの三角関数の和か差の形になおせ。

(1) $\cos 3x \cdot \cos 2x$

答 $\cos 3x \cdot \cos 2x =$

(2) $\sin 4x \cdot \sin x$

答 $\sin 4x \cdot \sin x =$

問 3

$\sin 75^\circ \cos 15^\circ$ の値を求めよ。

