

## 三角関数 3 三角関数の性質

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(1)

$$\begin{aligned}
 \text{与式} &= \cos \theta - \sin \theta - \cos \theta + \cos \left\{ \left( \theta + \frac{\pi}{2} \right) + \pi \right\} \\
 &= -\sin \theta - \cos \left( \theta + \frac{\pi}{2} \right) \\
 &= -\sin \theta + \sin \theta \\
 &= 0
 \end{aligned}$$

(2)

$$\begin{aligned}
 \text{与式} &= \tan \theta - \frac{1}{\tan \theta} + \frac{1}{\tan \theta} - \tan \theta \\
 &= 0
 \end{aligned}$$

(3)

$$\begin{aligned}
 \text{与式} &= -\sin \theta \sin \{ (\pi - \theta) + 2\pi \} - \sin \left\{ \left( \theta + \frac{\pi}{2} \right) + \pi \right\} (-\cos \theta) \\
 &= -\sin \theta \sin(\pi - \theta) - \left\{ -\sin \left( \theta + \frac{\pi}{2} \right) \right\} (-\cos \theta) \\
 &= -\sin \theta \sin \theta - \sin \left( \theta + \frac{\pi}{2} \right) \cos \theta \\
 &= -\sin^2 \theta - \cos^2 \theta \\
 &= -(\sin^2 \theta + \cos^2 \theta) \\
 &= -1
 \end{aligned}$$

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 $9\alpha = \pi$  より,

$$\begin{aligned}
 \text{与式} &= \cos 2\alpha + \cos 4\alpha + \cos(9\alpha - 4\alpha) + \cos(9\alpha - 2\alpha) \\
 &= \cos 2\alpha + \cos 4\alpha + \cos(\pi - 4\alpha) + \cos(\pi - 2\alpha) \\
 &= \cos 2\alpha + \cos 4\alpha - \cos 4\alpha - \cos 2\alpha \\
 &= 0
 \end{aligned}$$