高 2HL 数学　小テスト　１学期第 5 講

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① $0 \leq x < 2\pi$ のとき、次の方程式を解け。

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

[解]

(1) $\sin x + \sqrt{3} \cos x = -1$

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

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

$0 \leq x < 2\pi$ より

$$x + \frac{\pi}{3} = \frac{7}{6}\pi$$

$$x + \frac{\pi}{3} = \frac{11}{6}\pi$$

よって

$$\boldsymbol{x = \frac{5}{6}\pi , \frac{3}{2}\pi}$$

(2) $\sqrt{3} \sin x + \cos x = \sqrt{2}$

$$2 \sin\left(x + \frac{\pi}{6}\right) = \sqrt{2}$$

$$\sin\left(x + \frac{\pi}{6}\right) = \frac{\sqrt{2}}{2}\left(= \frac{1}{\sqrt{2}}\right)$$

$0 \leq x < 2\pi$ より

$$x + \frac{\pi}{6} = \frac{\pi}{4}$$

$$x + \frac{\pi}{6} = \frac{3}{4}\pi$$

よって

$$\boldsymbol{x = \frac{\pi}{12} , \frac{7}{12}\pi}$$