

③ さんかく 10

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$0 \leq \theta < 2\pi$ のとき、次の方程式を解け。

(1) $5 \sin \theta - 2 \cos^2 \theta + 4 = 0$

(2) $2 \cos^2 \theta - 3 \sin \theta = 0$

(3) $\sin\left(2\theta + \frac{\pi}{4}\right) = 0$

(4) $2 \cos\left(\theta - \frac{\pi}{6}\right) = 1$

(1) $\cos^2 \theta = 1 - \sin^2 \theta$

$5 \sin \theta - 2(1 - \sin^2 \theta) + 4 = 0$

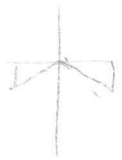
$2 \sin^2 \theta + 5 \sin \theta + 2 = 0$

$(2 \sin \theta + 1)(\sin \theta + 2) = 0$

$\sin \theta = -\frac{1}{2}, -2$

$-1 \leq \sin \theta \leq 1$ より $\sin \theta = -\frac{1}{2}$

$\therefore \theta = \frac{7}{6}\pi, \frac{11}{6}\pi$



$2\pi - \frac{\pi}{6}$

⑤

$2\theta + \frac{\pi}{4} = X$ とおくと

$0 \leq 2\theta < 4\pi$ より

$\frac{\pi}{4} \leq 2\theta + \frac{\pi}{4} < \frac{17}{4}\pi$ より

$\frac{\pi}{4} \leq X < \frac{17}{4}\pi$

$\sin X = 0$ とすると

$X = \pi, 2\pi, 3\pi, 4\pi$

$2\theta + \frac{\pi}{4} = \pi$ より

$\theta = \frac{3}{8}\pi$

$2\theta + \frac{\pi}{4} = 3\pi$ より

$\theta = \frac{11}{8}\pi$

$2\theta + \frac{\pi}{4} = 2\pi$ より

$\theta = \frac{7}{8}\pi$

$2\theta + \frac{\pi}{4} = 4\pi$ より

$\theta = \frac{15}{8}\pi$

よって θ は $\frac{3}{8}\pi, \frac{7}{8}\pi, \frac{11}{8}\pi, \frac{15}{8}\pi$

$\theta = \frac{3}{8}\pi, \frac{7}{8}\pi, \frac{11}{8}\pi, \frac{15}{8}\pi$

(2) $\cos^2 \theta = 1 - \sin^2 \theta$

$2(1 - \sin^2 \theta) - 3 \sin \theta = 0$

$2 \sin^2 \theta + 3 \sin \theta - 2 = 0$

$(\sin \theta + 2)(2 \sin \theta - 1) = 0$

$\sin \theta = -2, \frac{1}{2}$ $-1 \leq \sin \theta \leq 1$ より

$\sin \theta = \frac{1}{2}$

$\therefore \theta = \frac{\pi}{6}, \frac{5}{6}\pi$

$\frac{1}{2} \times 2 \rightarrow \frac{1}{2} \times 2 \rightarrow \frac{1}{2} \times 2 \rightarrow \frac{1}{2} \times 2$

⑥

$\theta - \frac{\pi}{6} = X$ とおくと

$-\frac{\pi}{6} \leq \theta - \frac{\pi}{6} < \frac{11}{6}\pi$

$-\frac{\pi}{6} \leq X < \frac{11}{6}\pi$ より

$\cos X = \frac{1}{2}$ より $X = \frac{\pi}{3}, \frac{5}{3}\pi$

$X = \frac{\pi}{3}, \frac{5}{3}\pi$

$\theta - \frac{\pi}{6} = \frac{\pi}{3}$ より $\theta = \frac{\pi}{2}$

$\theta - \frac{\pi}{6} = \frac{5}{3}\pi$ より $\theta = \frac{11}{6}\pi$

よって θ は $\frac{\pi}{2}, \frac{11}{6}\pi$

$\theta = \frac{\pi}{2}, \frac{11}{6}\pi$