

94 【方程式】以下の方程式を解け.

(1) $|2x+1|=3$

$$2x+1=\pm 3$$

$$2x=-1\pm 3$$

$$=2, -4$$

$$\therefore x=\underline{1, -2}$$

(2) $2x^2+3x+1=0$

$$(2x+1)(x+1)=0$$

$$x=\underline{-\frac{1}{2}, -1}$$

(3) $3x^3+x^2-3x-1=0$

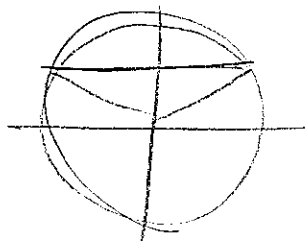
$$(3x+1)x^2-(3x+1)=0$$

$$(3x+1)(x^2-1)=0$$

$$(3x+1)(x-1)(x+1)=0$$

$$x=\underline{\pm 1, -\frac{1}{3}}$$

(4) $\sin x = \frac{1}{2} \quad (0 \leq x < 2\pi)$



$$x=\underline{\frac{\pi}{6}, \frac{5\pi}{6}}$$

(5) $2\cos^2 x - \cos x - 1 = 0 \quad (0 \leq x < 2\pi)$

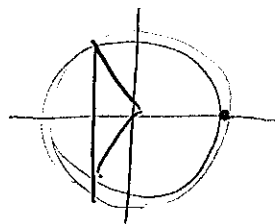
$$\text{let } t = \cos x \quad -1 \leq t \leq 1$$

$$2t^2 - t - 1 = 0$$

$$(2t+1)(t-1)=0$$

$$t=\underline{-\frac{1}{2}, 1}$$

$$\therefore \cos x = -\frac{1}{2}, 1$$



よって

$$x=\underline{0, \frac{2\pi}{3}, \frac{4\pi}{3}}$$

(6) $2^{3x+1} = 8$

$$2^{3x+1} = 2^3$$

$$\therefore 3x+1 = 3$$

$$3x = 2$$

$$\underline{x = \frac{2}{3}}$$

(7) $4^x - 3 \cdot 2^{x+2} - 64 = 0$

$$4^x - 3 \cdot 4 \cdot 2^x - 64 = 0$$

$$(2^x)^2 - 12 \cdot 2^x - 64 = 0$$

$$t = 2^x \text{ 且 } t > 0$$

$$t^2 - 12t - 64 = 0$$

$$(t-16)(t+4) = 0$$

$$\begin{aligned} t > 0 \therefore \\ t &= 16 \\ \therefore 2^x &= 16 \end{aligned}$$

$$\underline{x = 4}$$

(8) $\log_2(x+7) = 3 \log_2 3$

$$\log_2(x+7) = \log_2 3^3$$

$$= \log_2 9$$

真数必须为正数

$$x+7 = 9$$

$$\underline{x = 2}$$

(9) $\log_2(x+1) + \log_2(5-x) = 3$

真数必须为正数

$$\begin{aligned} x+1 > 0 &\Leftrightarrow x > -1 \\ 5-x > 0 &\Leftrightarrow x < 5 \end{aligned} \quad \therefore -1 < x < 5 \quad \text{--- ①}$$

$$\log_2(x+1) + \log_2(5-x) = \log_2 2^3$$

$$(x+1)(5-x) = 8$$

$$x^2 - 4x + 3 = 0$$

$$(x-1)(x-3) = 0$$

$$\underline{x = 1, 3}$$