

指数対数3

次の方程式, 不等式を解け。

(1)  $8^{2x+3} = 2^{3x+5}$

(2)  $\left(\frac{1}{4}\right)^x \geq \frac{1}{8}$

(3)  $\log_2 x + \log_2 (x+3) = 2$

(4)  $\log_5 (x-2) < \log_5 (6-x)$

1)

$$2^3(2x+3) = 2^{3x+5}$$

$$3(2x+3) = 3x+5$$

$$6x+9 = 3x+5$$

$$3x = -4 \quad \underline{x = -\frac{4}{3}}$$

2)  $\left(\frac{1}{2}\right)^{2x} \geq \left(\frac{1}{2}\right)^3$

$$2x \leq 3 \quad \underline{x \leq \frac{3}{2}}$$

3)  $\log_2 x(x+3) = \log_2 2^2 \quad \forall x > 0$

$$x(x+3) = 4$$

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

$$(x+4)(x-1) = 0$$

$$x > 0 \text{ 故 } \underline{x = 1}$$

4)  $x-2 > 0 \text{ 故 } x > 2 \quad 6-x > 0 \text{ 故 } x < 6$

$$\therefore 2 < x < 6 \quad \dots \textcircled{1}$$

$$x-2 < 6-x \text{ 故 } x < 4$$

$$2x < 8$$

$$x < 4 \quad \dots \textcircled{2}$$

$$\textcircled{1}, \textcircled{2} \text{ 故}$$

$$\underline{2 < x < 4}$$