

次の方程式を解け。

$$(1) 27^x = \frac{1}{9}$$

$$(2) 2^{3x-2} = 128$$

$$(3) \sqrt{5}^x = \frac{1}{25}$$

$$(4) 125^{x-1} = \left(\frac{1}{25}\right)^{x-6}$$

$$(5) 4^x + 2^{x+1} - 24 = 0$$

$$(6) \begin{cases} 3^{x+y} = 2 \\ 3^x - 3^{y+1} = 1 \end{cases}$$