

数学 I・A 第 1 問 [1]

$$\begin{aligned}\left(x + \frac{2}{x}\right)^2 &= x^2 + 2 \cdot x \cdot \frac{2}{x} + \frac{4}{x^2} = x^2 + \frac{4}{x^2} + 4 \\ &= 9 + 4 = \text{ア} 13\end{aligned}$$

x は正の実数であるから $x + \frac{2}{x} > 0$

よって $x + \frac{2}{x} = \sqrt{13}$

さらに $x^3 + \frac{8}{x^3} = \left(x + \frac{2}{x}\right)\left(x^2 - x \cdot \frac{2}{x} + \frac{4}{x^2}\right)$

$$\begin{aligned}&= \left(x + \frac{2}{x}\right)\left(x^2 + \frac{4}{x^2} - \text{ウ} 2\right) \\ &= \sqrt{13} \times (9 - 2) = \text{エ} 7\sqrt{\text{オカ} 13}\end{aligned}$$

また $x^4 + \frac{16}{x^4} = \left(x^2 + \frac{4}{x^2}\right)^2 - 2 \cdot x^2 \cdot \frac{4}{x^2}$

$$= 9^2 - 8 = \text{キク} 73$$