



2016年経済(2期)第2問

2 $x = \sqrt{7} + \sqrt{2}$, $y = \sqrt{7} - \sqrt{2}$ のとき, 以下の設問に答えよ.

- (1) $x + y$ を計算せよ.
 (2) xy を計算せよ.
 (3) $x^2 + y^2 - xy$ を計算せよ.
 (4) $x^3 + y^3$ を計算せよ.

$$\begin{aligned} (1) \quad x + y &= \sqrt{7} + \sqrt{2} + \sqrt{7} - \sqrt{2} \\ &= \underline{2\sqrt{7}} \text{,,} \end{aligned}$$

$$\begin{aligned} (2) \quad xy &= (\sqrt{7} + \sqrt{2})(\sqrt{7} - \sqrt{2}) \\ &= 7 - 2 \\ &= \underline{5} \text{,,} \end{aligned}$$

$$\begin{aligned} (3) \quad x^2 + y^2 - xy &= (x + y)^2 - 3xy \\ &= (2\sqrt{7})^2 - 3 \cdot 5 \\ &= 28 - 15 \\ &= \underline{13} \text{,,} \end{aligned}$$

$$\begin{aligned} (4) \quad x^3 + y^3 &= (x + y)(x^2 + y^2 - xy) \\ &= 2\sqrt{7} \cdot 13 \\ &= \underline{26\sqrt{7}} \text{,,} \end{aligned}$$

$$\begin{aligned} (\text{別解}) \quad x^3 + y^3 &= (x + y)^3 - 3xy(x + y) \\ &= (2\sqrt{7})^3 - 3 \cdot 5 \cdot 2\sqrt{7} \\ &= 56\sqrt{7} - 30\sqrt{7} \\ &= 26\sqrt{7} \end{aligned}$$