

【要点】 ⑦乗法公式の利用 (まだ未習の人はテストに出ません)

(1) $(x+a)(x+b) = x^2 + (a+b)x + ab$ の利用

$$\begin{aligned} \text{[例]} & (\sqrt{7}+3)(\sqrt{7}-5) \\ & = (\sqrt{7})^2 + (3-5)\sqrt{7} + 3 \times (-5) \\ & = 7 - 2\sqrt{7} - 15 \\ & = -8 - 2\sqrt{7} \end{aligned}$$

$$\begin{aligned} & (\sqrt{3}-2\sqrt{2})(\sqrt{3}+\sqrt{2}) \\ & = (\sqrt{3})^2 + (-2\sqrt{2}+\sqrt{2})\sqrt{3} + (-2\sqrt{2}) \times \sqrt{2} \\ & = 3 - \sqrt{6} - 4 \\ & = -1 - \sqrt{6} \end{aligned}$$

(2) $(x+a)^2 = x^2 + 2ax + a^2$ の利用

$$\begin{aligned} \text{[例]} & (\sqrt{3}+5)^2 \\ & = (\sqrt{3})^2 + 2 \times 5 \times \sqrt{3} + 5^2 \\ & = 3 + 10\sqrt{3} + 25 \\ & = 28 + 10\sqrt{3} \end{aligned}$$

$$\begin{aligned} & (\sqrt{6}+2\sqrt{5})^2 \\ & = (\sqrt{6})^2 + 2 \times 2\sqrt{5} \times \sqrt{6} + (2\sqrt{5})^2 \\ & = 6 + 4\sqrt{30} + 20 \\ & = 26 + 4\sqrt{30} \end{aligned}$$

(3) $(x-a)^2 = x^2 - 2ax + a^2$ の利用

$$\begin{aligned} \text{[例]} & (\sqrt{2}-4)^2 \\ & = (\sqrt{2})^2 - 2 \times 4 \times \sqrt{2} + 4^2 \\ & = 2 - 8\sqrt{2} + 16 \\ & = 18 - 8\sqrt{2} \end{aligned}$$

$$\begin{aligned} & (\sqrt{2}-2\sqrt{3})^2 \\ & = (\sqrt{2})^2 - 2 \times 2\sqrt{3} \times \sqrt{2} + (2\sqrt{3})^2 \\ & = 2 - 4\sqrt{6} + 12 \\ & = 14 - 4\sqrt{6} \end{aligned}$$

(4) $(x+a)(x-a) = x^2 - a^2$ の利用

$$\begin{aligned} \text{[例]} & (\sqrt{6}-3)(\sqrt{6}-3) \\ & = (\sqrt{6})^2 - 3^2 \\ & = 6 - 9 \\ & = -3 \end{aligned}$$

$$\begin{aligned} & (2\sqrt{3}-\sqrt{5})(2\sqrt{3}+\sqrt{5}) \\ & = (2\sqrt{3})^2 - (\sqrt{5})^2 \\ & = 12 - 5 \\ & = 7 \end{aligned}$$