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平方根の加減

年 組 番 名前

● 例題 1 ●

次の計算をなさい。

$$\begin{aligned} (1) \quad & \sqrt{2}(\sqrt{6} + 3\sqrt{2}) \\ &= \sqrt{12} + 3 \times 2 \\ &= 2\sqrt{3} + 6 \quad \rightarrow 71 \text{ の例題 2 へ} \end{aligned}$$

問1 次の計算をなさい。

$$\begin{aligned} (1) \quad & \sqrt{2}(\sqrt{3} + \sqrt{5}) \\ &= \sqrt{6} + \sqrt{10} \\ & \text{答. } \underline{\underline{\sqrt{6} + \sqrt{10}}} \end{aligned}$$

$$\begin{aligned} (2) \quad & \sqrt{3}(\sqrt{3} - 2) \\ &= 3 - 2\sqrt{3} \\ & \text{答. } \underline{\underline{3 - 2\sqrt{3}}} \end{aligned}$$

$$\begin{aligned} (3) \quad & \sqrt{3}(\sqrt{6} + 2\sqrt{3}) \\ &= \sqrt{18} + 2 \times 3 \\ &= 3\sqrt{2} + 6 \\ & \text{答. } \underline{\underline{3\sqrt{2} + 6}} \end{aligned}$$

$$\begin{aligned} (4) \quad & \sqrt{5}(\sqrt{20} - \sqrt{5}) \\ &= \sqrt{100} - 5 \\ &= 10 - 5 \\ &= 5 \\ & \text{答. } \underline{\underline{5}} \end{aligned}$$

$$\begin{aligned} (5) \quad & (\sqrt{6} + 2\sqrt{3}) \div \sqrt{3} \\ &= \sqrt{2} + 2 \\ & \text{答. } \underline{\underline{\sqrt{2} + 2}} \end{aligned}$$

● 例題 2 ●

次の計算をなさい。

$$\begin{aligned} (1) \quad & (\sqrt{3} + 2)(\sqrt{3} - 2) \\ &= (\sqrt{3})^2 - 2^2 \\ &= 3 - 4 \\ &= -1 \\ (2) \quad & (\sqrt{3} - 2)^2 \\ &= (\sqrt{3})^2 - 2 \times \sqrt{3} \times 2 + 2^2 \\ &= 3 - 4\sqrt{3} + 4 \\ &= 7 - 4\sqrt{3} \quad \rightarrow 83 \text{ の例題 1, 2 へ} \end{aligned}$$

問2 次の計算をなさい。

$$\begin{aligned} (1) \quad & (\sqrt{5} + 2)(\sqrt{5} - 2) \\ &= 5 - 4 \\ &= 1 \\ & \text{答. } \underline{\underline{1}} \end{aligned}$$

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

$$\begin{aligned} (3) \quad & (\sqrt{2} + 1)^2 \\ &= 2 + 2\sqrt{2} + 1 \\ &= 3 + 2\sqrt{2} \\ & \text{答. } \underline{\underline{3 + 2\sqrt{2}}} \end{aligned}$$

$$\begin{aligned} (4) \quad & (\sqrt{3} - \sqrt{2})^2 \\ &= 3 - 2\sqrt{6} + 2 \\ &= 5 - 2\sqrt{6} \\ & \text{答. } \underline{\underline{5 - 2\sqrt{6}}} \end{aligned}$$

$$\begin{aligned} (5) \quad & (\sqrt{5} + 2)(\sqrt{5} + 3) \\ &= 5 + 5\sqrt{5} + 6 \\ &= 11 + 5\sqrt{5} \\ & \text{答. } \underline{\underline{11 + 5\sqrt{5}}} \end{aligned}$$

$$\begin{aligned} (6) \quad & (\sqrt{6} + 1)(\sqrt{6} - 4) \\ &= 6 - 3\sqrt{6} - 4 \\ &= 2 - 3\sqrt{6} \\ & \text{答. } \underline{\underline{2 - 3\sqrt{6}}} \end{aligned}$$

● 例題 3 ●

次の計算をなさい。

$$\begin{aligned} (1) \quad & x = \sqrt{3} + \sqrt{2}, y = \sqrt{3} - \sqrt{2} \text{ の} \\ & \text{とき、} x^2 - y^2 \text{ の値を求めよ。} \\ & x + y = \sqrt{3} + \sqrt{2} + \sqrt{3} - \sqrt{2} = 2\sqrt{3} \\ & x - y = \sqrt{3} + \sqrt{2} - (\sqrt{3} - \sqrt{2}) \\ & \quad = 2\sqrt{2} \\ & x^2 - y^2 = (x + y)(x - y) \\ & \quad = 2\sqrt{3} \times 2\sqrt{2} \\ & \quad = 4\sqrt{6} \end{aligned}$$

問3 $x = \sqrt{2} + 1$ 、 $y = \sqrt{2} - 1$ のとき、 $x^2 - y^2$ の値を求めよ。

$$\begin{aligned} x + y &= \sqrt{2} + 1 + \sqrt{2} - 1 = 2\sqrt{2} \\ x - y &= \sqrt{2} + 1 - (\sqrt{2} - 1) = 2 \\ x^2 - y^2 &= (x + y)(x - y) \\ &= 2\sqrt{2} \times 2 \\ &= 4\sqrt{2} \\ & \text{答. } \underline{\underline{4\sqrt{2}}} \end{aligned}$$