

① 次の計算をせよ。

$$(1) \sqrt{3} \times \sqrt{3} = (\sqrt{3})^2 = \underline{3}$$

$$(2) 2\sqrt{5} \times \sqrt{5} = 2 \times (\sqrt{5})^2 = \underline{10}$$

$$(3) \sqrt{3}(\sqrt{3} + \sqrt{2}) = \underline{3 + \sqrt{6}}$$

$$(4) \sqrt{2}(\sqrt{3} + \sqrt{2}) = \underline{\sqrt{6} + 2}$$

$$(5) (\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2}) = (\sqrt{3})^2 - (\sqrt{2})^2 = 3 - 2 = \underline{1}$$

$$(6) (1 + \sqrt{2} + \sqrt{3})(1 + \sqrt{2} - \sqrt{3})$$

$$= \{(1 + \sqrt{2}) + \sqrt{3}\} \{(1 + \sqrt{2}) - \sqrt{3}\}$$

$$= (1 + \sqrt{2})^2 - (\sqrt{3})^2$$

$$= 1 + 2\sqrt{2} + 2 - 3$$

$$= \underline{2\sqrt{2}}$$

③ 練習34

$$(1) \frac{2}{\sqrt{3}} = \frac{2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} = \frac{2\sqrt{3}}{3}$$

$$(2) \frac{4}{\sqrt{2}} = \frac{4 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{4\sqrt{2}}{2} = 2\sqrt{2}$$

$$(3) \frac{\sqrt{3}}{\sqrt{2}} = \frac{\sqrt{3} \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} = \frac{\sqrt{6}}{2}$$

$$(4) \frac{1}{2\sqrt{5}} = \frac{1 \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} = \frac{\sqrt{5}}{10}$$

練習35

$$(1) \frac{1}{\sqrt{3} + \sqrt{2}} = \frac{\sqrt{3} - \sqrt{2}}{(\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2})}$$

$$= \frac{\sqrt{3} - \sqrt{2}}{(\sqrt{3})^2 - (\sqrt{2})^2}$$

$$= \sqrt{3} - \sqrt{2}$$

$$(2) \frac{\sqrt{2}}{\sqrt{5}-\sqrt{3}} = \frac{\sqrt{2}(\sqrt{5}+\sqrt{3})}{(\sqrt{5}-\sqrt{3})(\sqrt{5}+\sqrt{3})}$$

$$= \frac{\sqrt{10}+\sqrt{6}}{(\sqrt{5})^2-(\sqrt{3})^2}$$

$$= \frac{\sqrt{10}+\sqrt{6}}{2}$$

$$(3) \frac{2\sqrt{3}}{\sqrt{6}-2} = \frac{2\sqrt{3}(\sqrt{6}+2)}{(\sqrt{6}-2)(\sqrt{6}+2)}$$

$$= \frac{6\sqrt{2}+4\sqrt{3}}{(\sqrt{6})^2-2^2} = \frac{2(3\sqrt{2}+2\sqrt{3})}{2}$$

$$= 3\sqrt{2}+2\sqrt{3} \quad \checkmark \text{ (約分)}$$

$$(4) \frac{\sqrt{3}+1}{\sqrt{3}-1} = \frac{(\sqrt{3}+1)^2}{(\sqrt{3}-1)(\sqrt{3}+1)} \quad \left. \begin{array}{l} (a+b)^2 \\ = a^2+2ab+b^2 \end{array} \right\}$$

$$= \frac{(\sqrt{3})^2+2\sqrt{3}+1^2}{(\sqrt{3})^2-1^2}$$

$$= \frac{4+2\sqrt{3}}{2} = \frac{2(2+\sqrt{3})}{2}$$

$$= 2+\sqrt{3} \quad \checkmark \text{ (約分)}$$

[4] 次の式の分母を有理化せよ。(写す)

$$(1) \text{与式} = \frac{1+\sqrt{5}-\sqrt{6}}{\{(1+\sqrt{5})+\sqrt{6}\}\{(1+\sqrt{5})-\sqrt{6}\}}$$

$$= \frac{1+\sqrt{5}-\sqrt{6}}{(1+\sqrt{5})^2-(\sqrt{6})^2}$$

$$= \frac{1+\sqrt{5}-\sqrt{6}}{(1+2\sqrt{5}+5)-6}$$

$$= \frac{1+\sqrt{5}-\sqrt{6}}{2\sqrt{5}}$$

$$= \frac{(1+\sqrt{5}-\sqrt{6})\sqrt{5}}{2(\sqrt{5})^2}$$

$$= \frac{5+\sqrt{5}-\sqrt{30}}{10}$$

① $\frac{0}{\sqrt{A}} \rightarrow \frac{\sqrt{A}}{\sqrt{A}}$ とかける

② $\frac{0}{\sqrt{A}+\sqrt{B}} \rightarrow \frac{\sqrt{A}-\sqrt{B}}{\sqrt{A}-\sqrt{B}}$ とかける

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分母が3項のときは2項に揃える
!!!!!!

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$A=1+\sqrt{5}$ としてみる

$$(2) \text{与式} = \frac{\{1-(\sqrt{2}-\sqrt{3})\}\{1+(\sqrt{2}-\sqrt{3})\}}{\{(1+\sqrt{2})+\sqrt{3}\}\{(1+\sqrt{2})-\sqrt{3}\}}$$

$$= \frac{1^2-(\sqrt{2}-\sqrt{3})^2}{(1+\sqrt{2})^2-(\sqrt{3})^2}$$

$$= \frac{1-(2-2\sqrt{6}+3)}{(1+2\sqrt{2}+2)-3}$$

$$= \frac{2\sqrt{6}-4}{2\sqrt{2}}$$

$$= \frac{\sqrt{6}-2}{\sqrt{2}}$$

$$= \frac{\sqrt{2}(\sqrt{6}-2)}{\sqrt{2} \times \sqrt{2}}$$

$$= \frac{2\sqrt{3}-2\sqrt{2}}{2}$$

$$= \frac{2(\sqrt{3}-\sqrt{2})}{2}$$

$$= \sqrt{3}-\sqrt{2}$$

自分の持っている知識で
試行錯誤するのは
大切!!

1 次の式を展開せよ。(復習)

$$(1) (x+y)^2 = x^2 + 2xy + y^2$$

$$(2) (x+y)^3 = x^3 + 3x^2y + 3xy^2 + y^3$$

2 1 の等式を移項により変形せよ。

$$(1) x^2 + y^2 = (x+y)^2 - 2xy$$

$$(2) x^3 + y^3 = (x+y)^3 - 3x^2y - 3xy^2 \\ = (x+y)^3 - 3xy(x+y)$$

※ 2 の結果を活用して以下の問いに答えなさい。

3 $x+y=2$ 、 $xy=-1$ のとき、次の式の値を求めよ。

$$(1) x^2 + y^2 = (x+y)^2 - 2xy \\ = 2^2 - 2 \times (-1) \\ = 6$$

$$(2) x^3 + y^3 = (x+y)^3 - 3xy(x+y) \\ = 8 - 3 \times (-1) \times 2 \\ = 14$$

$$(3) x^2y + xy^2 = xy(x+y) \\ = -1 \times 2 \\ = -2$$

$$(4) \frac{1}{x} + \frac{1}{y} = \frac{y}{xy} + \frac{x}{xy} \\ = \frac{x+y}{xy} \\ = \frac{2}{-1} = -2$$

4 p.30の例題→練習36, 37と解き進めましょう。