

〔学習プリント19〕

練習35 次の式を計算せよ。

- (1) $\sqrt{2}\sqrt{3} = \sqrt{2 \times 3} = \sqrt{6}$
- (2) $\sqrt{2}\sqrt{5} = \sqrt{2 \times 5} = \sqrt{10}$
- (3) $\frac{\sqrt{6}}{\sqrt{3}} = \sqrt{\frac{6}{3}} = \sqrt{2}$
- (4) $\frac{\sqrt{8}}{\sqrt{2}} = \sqrt{\frac{8}{2}} = \sqrt{4} = \sqrt{2^2} = 2$

練習38 次の式を計算せよ。

- (1) $5\sqrt{3} - 2\sqrt{3} + \sqrt{3}$
 $= (5 - 2 + 1)\sqrt{3}$
 $= 4\sqrt{3}$
- (2) $\sqrt{2} + \sqrt{32} - \sqrt{72}$
 $= \sqrt{2} + 4\sqrt{2} - 6\sqrt{2}$
 $= (1 + 4 - 6)\sqrt{2}$
 $= -\sqrt{2}$

$$\begin{array}{r} 2 \overline{) 32} \\ 2 \overline{) 16} \\ 2 \overline{) 8} \\ 2 \overline{) 4} \\ 2 \end{array}$$

$$\begin{array}{r} 2 \overline{) 72} \\ 2 \overline{) 36} \\ 2 \overline{) 18} \\ 3 \overline{) 9} \\ 3 \end{array}$$
- (3) $(5\sqrt{2} - 3\sqrt{3}) - (2\sqrt{2} + \sqrt{3})$
 $= 5\sqrt{2} - 3\sqrt{3} - 2\sqrt{2} - \sqrt{3}$
 $= 5\sqrt{2} - 2\sqrt{2} - 3\sqrt{3} - \sqrt{3}$
 $= (5 - 2)\sqrt{2} + (-3 - 1)\sqrt{3}$
 $= 3\sqrt{2} - 4\sqrt{3}$
- (4) $(2\sqrt{5} + 3\sqrt{6}) - (\sqrt{96} - \sqrt{45})$
 $= (2\sqrt{5} + 3\sqrt{6}) - (4\sqrt{6} - 3\sqrt{5})$
 $= 2\sqrt{5} + 3\sqrt{6} - 4\sqrt{6} + 3\sqrt{5}$
 $= 2\sqrt{5} + 3\sqrt{5} + 3\sqrt{6} - 4\sqrt{6}$
 $= (2 + 3)\sqrt{5} + (3 - 4)\sqrt{6}$
 $= 5\sqrt{5} - \sqrt{6}$

$$\begin{array}{r} 2 \overline{) 96} \\ 2 \overline{) 48} \\ 2 \overline{) 24} \\ 2 \overline{) 12} \\ 2 \overline{) 6} \\ 3 \end{array}$$

$$\begin{array}{r} 3 \overline{) 45} \\ 3 \overline{) 15} \\ 5 \end{array}$$

演習1 次の式を計算せよ。

- (1) $\sqrt{3} \times \sqrt{15} = \sqrt{3 \times 15} = \sqrt{45} = 3\sqrt{5}$
- (2) $\sqrt{6} \times \sqrt{14} = \sqrt{6 \times 14} = \sqrt{84} = 2\sqrt{21}$
- (3) $\frac{\sqrt{24}}{\sqrt{3}} = \sqrt{\frac{24}{3}} = \sqrt{8} = 2\sqrt{2}$
- (4) $\frac{\sqrt{90}}{\sqrt{5}} = \sqrt{\frac{90}{5}} = \sqrt{18} = 3\sqrt{2}$

$$\begin{array}{r} 3 \overline{) 45} \\ 3 \overline{) 15} \\ 5 \end{array}$$

$$\begin{array}{r} 2 \overline{) 84} \\ 2 \overline{) 42} \\ 3 \overline{) 21} \\ 7 \end{array}$$

$$\begin{array}{r} 2 \overline{) 8} \\ 2 \overline{) 4} \\ 2 \end{array}$$

$$\begin{array}{r} 2 \overline{) 18} \\ 3 \overline{) 9} \\ 3 \end{array}$$

演習2 次の式を計算せよ。

- (1) $2\sqrt{5} + 6\sqrt{5} - 4\sqrt{5}$
 $= (2 + 6 - 4)\sqrt{5}$
 $= 4\sqrt{5}$
- (2) $2\sqrt{5} - 4\sqrt{2} - 3\sqrt{2} + \sqrt{5}$
 $= 2\sqrt{5} + \sqrt{5} - 4\sqrt{2} - 3\sqrt{2}$
 $= (2 + 1)\sqrt{5} + (-4 - 3)\sqrt{2}$
 $= 3\sqrt{5} - 7\sqrt{2}$
- (3) $\sqrt{18} + \sqrt{50}$
 $= 3\sqrt{2} + 5\sqrt{2}$
 $= (3 + 5)\sqrt{2}$
 $= 8\sqrt{2}$

$$\begin{array}{r} 2 \overline{) 18} \\ 3 \overline{) 9} \\ 3 \end{array}$$

$$\begin{array}{r} 2 \overline{) 50} \\ 5 \overline{) 25} \\ 5 \end{array}$$
- (4) $\sqrt{28} - \sqrt{63} + \sqrt{112}$
 $= 2\sqrt{7} - 3\sqrt{7} + 4\sqrt{7}$
 $= (2 - 3 + 4)\sqrt{7}$
 $= 3\sqrt{7}$

$$\begin{array}{r} 2 \overline{) 28} \\ 2 \overline{) 14} \\ 7 \end{array}$$

$$\begin{array}{r} 3 \overline{) 63} \\ 3 \overline{) 21} \\ 7 \end{array}$$

$$\begin{array}{r} 2 \overline{) 112} \\ 2 \overline{) 56} \\ 2 \overline{) 28} \\ 2 \overline{) 14} \\ 7 \end{array}$$

〔学習プリント20〕

練習39 次の式を計算せよ。

- (1) $(4\sqrt{2} + 3\sqrt{5})(2\sqrt{2} - \sqrt{5})$
 $= 4\sqrt{2} \times 2\sqrt{2} - 4\sqrt{2} \times \sqrt{5}$
 $\quad \quad \quad + 3\sqrt{5} \times 2\sqrt{2} - 3\sqrt{5} \times \sqrt{5}$
 $= 16 - 4\sqrt{10} + 6\sqrt{10} - 15$
 $= 1 + 2\sqrt{10}$
- (2) $(2\sqrt{3} - \sqrt{6})(\sqrt{3} + 3\sqrt{6})$
 $= 2\sqrt{3} \times \sqrt{3} + 2\sqrt{3} \times 3\sqrt{6}$
 $\quad \quad \quad - \sqrt{6} \times \sqrt{3} - \sqrt{6} \times 3\sqrt{6}$
 $= 6 + 6\sqrt{18} - \sqrt{18} - 18$
 $= 6 + 18\sqrt{2} - 3\sqrt{2} - 18$
 $= -12 + 15\sqrt{2}$
- (3) $(\sqrt{7} + \sqrt{3})^2$
 $= (\sqrt{7})^2 + 2\sqrt{7}\sqrt{3} + (\sqrt{3})^2$
 $= 7 + 2\sqrt{21} + 3$
 $= 10 + 2\sqrt{21}$
- (4) $(\sqrt{6} - 2)^2$
 $= (\sqrt{6})^2 - 2\sqrt{6} \times 2 + 2^2$
 $= 6 - 4\sqrt{6} + 4$
 $= 10 - 4\sqrt{6}$

$$\begin{aligned}
 (5) \quad & (\sqrt{3} + \sqrt{2})(\sqrt{3} - \sqrt{2}) \\
 & = (\sqrt{3})^2 - (\sqrt{2})^2 \\
 & = 3 - 2 \\
 & = \underline{1}
 \end{aligned}$$

$$\begin{aligned}
 (6) \quad & (3 - \sqrt{5})(3 + \sqrt{5}) \\
 & = 3^2 - (\sqrt{5})^2 \\
 & = 9 - 5 \\
 & = \underline{4}
 \end{aligned}$$

演習 次の式を計算せよ。

$$\begin{aligned}
 (1) \quad & (\sqrt{7} + \sqrt{2})(2\sqrt{7} + 3\sqrt{2}) \\
 & = \sqrt{7} \times 2\sqrt{7} + \sqrt{7} \times 3\sqrt{2} + \sqrt{2} \times 2\sqrt{7} + \sqrt{2} \times 3\sqrt{2} \\
 & = 2 \times 7 + 3\sqrt{14} + 2\sqrt{14} + 3 \times 2 \\
 & = \underline{20 + 5\sqrt{14}}
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad & (3\sqrt{2} + \sqrt{6})^2 \\
 & = (3\sqrt{2})^2 + 2 \times 3\sqrt{2} \times \sqrt{6} + (\sqrt{6})^2 \\
 & = 9 \times 2 + 6\sqrt{12} + 6 \\
 & = \underline{24 + 12\sqrt{3}}
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad & (2\sqrt{6} - \sqrt{3})^2 \\
 & = (2\sqrt{6})^2 - 2 \times 2\sqrt{6} \times \sqrt{3} + (\sqrt{3})^2 \\
 & = 4 \times 6 - 4\sqrt{18} + 3 \\
 & = \underline{27 - 12\sqrt{2}}
 \end{aligned}$$

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

$$\begin{aligned}
 (5) \quad & (2\sqrt{7} + 3\sqrt{3})(2\sqrt{7} - 3\sqrt{3}) \\
 & = (2\sqrt{7})^2 - (3\sqrt{3})^2 \\
 & = 4 \times 7 - 9 \times 3 \\
 & = 28 - 27 \\
 & = \underline{1}
 \end{aligned}$$