

1 次の計算をしない。

(1) $4\sqrt{3} \times 2\sqrt{6}$

$$4 \times \sqrt{3} \times 2 \times \sqrt{3} \times \sqrt{2}$$

$$= 8 \times 3 \times \sqrt{2}$$

$$= 24\sqrt{2}$$

(2) $-3 \times 2\sqrt{15}$

$$= -6\sqrt{15}$$

(3) $6\sqrt{2} \times (-5\sqrt{10})$

$$= 6\sqrt{2} \times -5 \times \sqrt{2} \times \sqrt{5}$$

$$= -30 \times 2 \times \sqrt{5}$$

$$= -60\sqrt{5}$$

(4) $(-\sqrt{3})^2$

$$= 3$$

(5) $(3\sqrt{5})^2$

$$= 9 \times 5 = 45$$

(6) $(-4\sqrt{2})^2$

$$= 16 \times 2 = 32$$

(7) $\sqrt{40} \div \sqrt{5}$

$$= \sqrt{8} = 2\sqrt{2}$$

(8) $6\sqrt{6} \div 3\sqrt{10}$

$$= \frac{6\sqrt{6}}{3\sqrt{10}} = \frac{2\sqrt{3}}{\sqrt{5}}$$

$$= \frac{2\sqrt{3} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} \quad \left\{ \begin{array}{l} \text{有理化} \\ \text{分母} \end{array} \right.$$

$$= \frac{2\sqrt{15}}{5}$$

(9) $\sqrt{3} \div 2\sqrt{15}$

$$= \frac{\sqrt{3}}{2\sqrt{15}} = \frac{1}{2\sqrt{5}}$$

$$= \frac{1 \times \sqrt{5}}{2\sqrt{5} \times \sqrt{5}} \quad \left\{ \begin{array}{l} \text{有理化} \\ \text{分母} \end{array} \right.$$

$$= \frac{\sqrt{5}}{10}$$

(10) $3\sqrt{6} \times \sqrt{3} \div 9\sqrt{10}$

$$= \frac{3\sqrt{6} \times \sqrt{3} \times \sqrt{3}}{9\sqrt{2} \times \sqrt{5}}$$

$$= \frac{9}{9\sqrt{5}} = \frac{1}{\sqrt{5}} = \frac{\sqrt{5}}{5}$$

$$\quad \left\{ \begin{array}{l} \text{有理化} \\ \text{分母} \end{array} \right.$$

(11) $4\sqrt{15} \div 2\sqrt{20} \times \sqrt{3}$

$$= \frac{4\sqrt{3} \times \sqrt{5}}{2 \times 2\sqrt{2} \times \sqrt{5}} \times \sqrt{3}$$

$$= \frac{4\sqrt{3} \times \sqrt{3}}{4\sqrt{2}} = \frac{12}{2\sqrt{2}} = 3$$

(12) $\sqrt{\frac{5}{3}} \div \sqrt{15} \times \sqrt{\frac{5}{6}}$

$$= \frac{\sqrt{5}}{\sqrt{3}} \times \frac{\sqrt{5}}{\sqrt{6}} \times \frac{\sqrt{5}}{\sqrt{15}}$$

$$= \frac{\sqrt{5}}{3\sqrt{6}} = \frac{\sqrt{5} \times \sqrt{6}}{3\sqrt{6} \times \sqrt{6}} = \frac{\sqrt{30}}{18}$$

(13) $\sqrt{\frac{1}{2}} \times 4\sqrt{3} \div \sqrt{\frac{3}{10}}$

$$= \frac{1 \times 4\sqrt{3}}{\sqrt{2}} \times \frac{\sqrt{2} \times \sqrt{5}}{\sqrt{3}}$$

$$= 4\sqrt{5}$$

(14) $\sqrt{8} - 3\sqrt{2}$

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

$$= -\sqrt{2}$$

(15) $2\sqrt{5} + \sqrt{80}$

$$= 2\sqrt{5} + 4\sqrt{5}$$

$$= 6\sqrt{5}$$

(16) $\sqrt{90} - \sqrt{40}$

$$= 3\sqrt{10} - 2\sqrt{10}$$

$$= \sqrt{10}$$

(17) $\sqrt{12} + \sqrt{28} + \sqrt{63} - \sqrt{75}$

$$= 2\sqrt{3} + 2\sqrt{7} + 3\sqrt{7} - 5\sqrt{3}$$

$$= -3\sqrt{3} + 5\sqrt{7}$$

(18) $\sqrt{24} + 2 - \sqrt{20} + 3 - \sqrt{45} - \sqrt{54}$

$$= 2\sqrt{6} + 2 - 2\sqrt{5} + 3 - 3\sqrt{5} - 3\sqrt{6}$$

$$= 5 - \sqrt{6} - 5\sqrt{5}$$

(19) $\frac{\sqrt{18}}{5} - \frac{\sqrt{8}}{3}$

$$= \frac{3\sqrt{2}}{5} - \frac{2\sqrt{2}}{3} = \frac{9\sqrt{2} - 10\sqrt{2}}{15}$$

$$= \frac{-\sqrt{2}}{15}$$

(20) $\frac{\sqrt{27}}{4} + \frac{\sqrt{12}}{7}$

$$= \frac{3\sqrt{3}}{4} + \frac{2\sqrt{3}}{7} = \frac{21\sqrt{3} + 8\sqrt{3}}{28}$$

$$= \frac{29\sqrt{3}}{28}$$

(21) $\sqrt{45} - \frac{\sqrt{5}}{3}$

$$= 3\sqrt{5} - \frac{\sqrt{5}}{3}$$

$$= \frac{9\sqrt{5} - \sqrt{5}}{3} = \frac{8\sqrt{5}}{3}$$

(22) $\sqrt{60} - \frac{12\sqrt{5}}{\sqrt{3}}$

$$= 2\sqrt{15} - \frac{12\sqrt{5}}{\sqrt{3}} \quad \left\{ \begin{array}{l} \text{有理化} \\ \text{分母} \end{array} \right.$$

$$= 2\sqrt{15} - 4\sqrt{15}$$

$$= -2\sqrt{15}$$

(23) $\frac{15}{\sqrt{6}} + \sqrt{24}$

$$= \frac{15 \times \sqrt{6}}{\sqrt{6} \times \sqrt{6}} + 2\sqrt{6}$$

$$= \frac{15\sqrt{6}}{6} + 2\sqrt{6}$$

$$= \frac{5\sqrt{6}}{2} + 2\sqrt{6} = \frac{5\sqrt{6} + 4\sqrt{6}}{2}$$

$$= \frac{9\sqrt{6}}{2}$$

(24) $\sqrt{40} + \sqrt{\frac{5}{2}}$

$$= 2\sqrt{10} + \frac{\sqrt{5}}{\sqrt{2}}$$

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

$$= \frac{4\sqrt{10} + \sqrt{10}}{2} = \frac{5\sqrt{10}}{2}$$

(25) $\sqrt{5}(\sqrt{10} - \sqrt{30})$

$$= 5\sqrt{2} - 5\sqrt{6}$$

(26) $3\sqrt{3} - \sqrt{6} \times \sqrt{18}$

$$= 3\sqrt{3} - 6\sqrt{3}$$

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

(27) $4\sqrt{2}(\sqrt{14} + 2\sqrt{2})$

$$= (4\sqrt{2} \times \sqrt{14}) + (4\sqrt{2} \times 2\sqrt{2})$$

$$= (4\sqrt{2} \times \sqrt{2} \times \sqrt{7}) + (8 \times 2)$$

$$= (4 \times 2 \times \sqrt{7}) + 16$$

$$= 8\sqrt{7} + 16$$

$$= 4\sqrt{2}(\sqrt{14} + 2\sqrt{2})$$

$$= 4 \times 2 \times \sqrt{7} + 16$$

$$= 8\sqrt{7} + 16$$

(28) $(\sqrt{20} + \sqrt{10}) \div \sqrt{2}$

$$= \sqrt{10} + \sqrt{5}$$

(29) $(3\sqrt{12} - \sqrt{6}) \div \sqrt{3}$

$$= 3\sqrt{\frac{12}{3}} - \sqrt{\frac{6}{3}}$$

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

(30) $2\sqrt{6} - 4 \div \sqrt{6}$

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

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

$$= 2\sqrt{6} - \frac{2\sqrt{6}}{3} = \frac{6\sqrt{6} - 2\sqrt{6}}{3} = \frac{4\sqrt{6}}{3}$$

(31) $(\sqrt{2} + 8)(\sqrt{2} - 4)$

$$= 2 + 4\sqrt{2} - 3\sqrt{2} - 32$$

$$= -30 + \sqrt{2}$$

(32) $(2\sqrt{3} - 5)(2\sqrt{3} + 1)$

$$= (2 - 8\sqrt{3} - 5)$$

$$= 7 - 8\sqrt{3}$$

(33) $(\sqrt{7} + 4)^2$

$$= 7 + 8\sqrt{7} + 16$$

$$= 23 + 8\sqrt{7}$$

(34) $(\sqrt{5} - \sqrt{3})^2$

$$= 5 - 2\sqrt{15} + 3$$

$$= 8 - 2\sqrt{15}$$

(35) $(3\sqrt{5} - \sqrt{14})^2$

$$= 45 - 6\sqrt{70} + 14$$

$$= 59 - 6\sqrt{70}$$

(36) $(\sqrt{30} + 5)(\sqrt{30} - 5)$

$$= 30 - 25$$

$$= 5$$

(37) $(4\sqrt{5} + 9)(4\sqrt{5} - 9)$

$$= 80 - 81$$

$$= -1$$