

1 次の式を計算せよ。

- (1) 8^0 (2) 4^{-3} (3) 100^{-2} (4) $(-3)^{-5}$ (5) 0.5^{-3}
 (6) 6^0 (7) 4^{-2} (8) 0.3^{-3} (9) $(-2)^{-3}$

- 解答** (1) 1 (2) $\frac{1}{64}$ (3) $\frac{1}{10000}$ (4) $-\frac{1}{243}$ (5) 8
 (6) 1 (7) $\frac{1}{16}$ (8) $\frac{1000}{27}$ (9) $-\frac{1}{8}$

2 次の式を計算せよ。

- (1) $3^2 \times 3^{-3} \div 3^{-4}$ (2) $5^3 \times (5^{-1})^2 \div 5$ (3) $(-2^{-1})^{-3} \div 2^{-3} \times 2^4$
 (4) $(3^2)^{-3} \times 3^3 \div 9^{-2}$ (5) $2^5 \times 2^{-3}$ (6) $(6^2)^4 \div 6^7$
 (7) $(5^2 \times 3^{-1})^3 \times (5^{-3})^2$ (8) $5^3 \times 5^{-1}$ (9) $7^5 \div 7^3$ (10) $(2^{-2})^3$
 (11) $(3^2 \times 5^{-1})^2$ (12) $3^2 \times 3^{-3} \div 3^{-4}$ (13) $5^3 \times (5^{-1})^2 \div 5$
 (14) $(-2^{-1})^{-3} \div 2^{-3} \times 2^4$

- 解答** (1) 27 (2) 1 (3) -1024 (4) 3 (5) 4 (6) 6 (7) $\frac{1}{27}$
 (8) 25 (9) 49 (10) $\frac{1}{64}$ (11) $\frac{81}{25}$ (12) 27 (13) 1 (14) -1024

3 次の式を計算せよ。

- (1) $\sqrt[4]{256}$ (2) $\sqrt[3]{216}$ (3) $\sqrt[5]{0.00001}$
 (4) $\sqrt[3]{-216}$ (5) $\sqrt[5]{-32}$ (6) $\sqrt[3]{-\frac{1}{64}}$
 (7) $\sqrt[4]{16}$ (8) $\sqrt[3]{216}$ (9) $\sqrt[3]{\frac{1}{125}}$ (10) $\sqrt[5]{0.00001}$
 (11) $\sqrt[3]{125}$ (12) $\sqrt[4]{81}$ (13) $\sqrt[3]{1000000}$ (14) $\sqrt[3]{0.001}$
 (15) $\sqrt[3]{4} \sqrt[3]{54}$ (16) $\frac{\sqrt[4]{48}}{\sqrt[4]{3}}$ (17) $\sqrt[3]{\sqrt{64}}$ (18) $\sqrt[5]{4^3}$
 (19) $\sqrt[3]{64}$ (20) 64 の 3 乗根 (21) $\sqrt[4]{10000}$ (22) 10000 の 4 乗根
 (23) $\sqrt[3]{-216}$ (24) $\sqrt[5]{-32}$ (25) $\sqrt[3]{-0.001}$

- 解答** (1) 4 (2) 6 (3) 0.1 (4) -6 (5) -2 (6) $-\frac{1}{4}$
 (7) 2 (8) 6 (9) $\frac{1}{5}$ (10) 0.1 (11) 5 (12) 3 (13) 100
 (14) 0.1 (15) 6 (16) 2 (17) 2 (18) 2 (19) 4 (20) 4
 (21) 10 (22) ± 10 (23) -6 (24) -2 (25) -0.1

4 次の式を計算せよ。

- (1) $(\sqrt[4]{5})^8$ (2) $\sqrt[4]{4^8}$ (3) $\sqrt[3]{4} \sqrt[3]{10}$ (4) $\sqrt[4]{3} \sqrt[4]{27}$
 (5) $\frac{\sqrt[4]{64}}{\sqrt[4]{4}}$ (6) $\frac{\sqrt[3]{48}}{\sqrt[3]{3}}$ (7) $\sqrt[5]{\sqrt{1024}}$ (8) $\sqrt[3]{81}$
 (9) $\sqrt[4]{3} \sqrt[4]{27}$ (10) $\frac{\sqrt[4]{48}}{\sqrt[4]{3}}$ (11) $(\sqrt[5]{3})^5$ (12) $\sqrt[5]{\sqrt{1024}}$

- 解答** (1) 25 (2) 16 (3) $2\sqrt[3]{5}$ (4) 3 (5) 2 (6) $2\sqrt[3]{2}$ (7) 2
 (8) $\sqrt{3}$ (9) 3 (10) 2 (11) 3 (12) 2

5 次の式を計算せよ。

- (1) $9^{\frac{3}{2}}$ (2) $8^{-\frac{4}{3}}$ (3) $0.04^{1.5}$ (4) $\left(\frac{125}{64}\right)^{-\frac{2}{3}}$
 (5) $9^{\frac{1}{2}}$ (6) $27^{\frac{2}{3}}$ (7) $16^{-\frac{3}{4}}$ (8) $100^{-\frac{3}{2}}$

- 解答** (1) 27 (2) $\frac{1}{16}$ (3) 0.008 (4) $\frac{16}{25}$ (5) 3 (6) 9
 (7) $\frac{1}{8}$ (8) $\frac{1}{1000}$

6 次の式を計算せよ。

- (1) $6^{\frac{1}{2}} \times 36^{\frac{1}{4}}$ (2) $2^{-\frac{1}{2}} \times 2^{\frac{5}{6}} \div 2^{\frac{1}{3}}$ (3) $(9^{\frac{2}{3}} \times 3^{-2})^{\frac{3}{2}}$ (4) $\left\{\left(\frac{16}{25}\right)^{-\frac{3}{4}}\right\}^{\frac{2}{3}}$
 (5) $3^{\frac{2}{3}} \times 3^{\frac{4}{3}}$ (6) $5^{-\frac{1}{3}} \times 5^{\frac{4}{3}}$ (7) $16^{\frac{3}{8}} \div 16^{-\frac{5}{8}}$
 (8) $(3^{\frac{6}{5}})^{\frac{10}{3}}$ (9) $(8^{\frac{4}{9}})^{\frac{3}{2}}$ (10) $(8^{\frac{1}{2}} \times 4^{\frac{1}{4}})^{\frac{1}{2}} \div (4^{-\frac{3}{4}})^{\frac{2}{3}}$
 (11) $2^{\frac{5}{6}} \times 2^{-\frac{1}{2}} \div 2^{\frac{1}{3}}$ (12) $3^{\frac{1}{2}} \times 3^{\frac{3}{2}} \div 3^{\frac{5}{6}}$

- 解答** (1) 6 (2) 1 (3) $\frac{1}{3}$ (4) $\frac{5}{4}$ (5) 9 (6) 5 (7) 16
 (8) 81 (9) 4 (10) 4 (11) 1 (12) 3

7 次の式を計算せよ。

- (1) $\sqrt[3]{2} \times \sqrt[3]{4} \times \sqrt[3]{6}$ (2) $\sqrt[4]{6} \times \sqrt{6} \times \sqrt[4]{12}$ (3) $\sqrt{6} \times \sqrt[4]{54} \div \sqrt[4]{6}$
 (4) $\sqrt[3]{54} \times 2\sqrt{-2} \times \sqrt[3]{16}$ (5) $\sqrt{6} \times \sqrt[4]{54} \div \sqrt[4]{6}$ (6) $\sqrt[3]{\sqrt{125}} \times \sqrt[3]{-25} \div \sqrt[5]{5}$
 (7) $\sqrt[4]{27} \times \sqrt{27} \div \sqrt[4]{3}$ (8) $\sqrt[3]{2} \times 2^3 \div \sqrt[3]{16}$ (9) $\sqrt[3]{6} \times \sqrt{6} \times \sqrt[4]{6}$
 (10) $\sqrt[3]{6} \times \sqrt[5]{6} \times \sqrt[4]{12}$ (11) $\sqrt[3]{2} \times \sqrt[3]{6} \times \sqrt[3]{18}$ (12) $\sqrt[3]{3} \times \sqrt[3]{3} \div \sqrt{3}$

(13) $(\sqrt[3]{2} - \sqrt[3]{16})^3 \times \left\{ \left(\frac{9}{4} \right)^{\frac{2}{3}} \right\}^{\frac{3}{2}}$

- 解答** (1) -24 (2) $3\sqrt{2}$ (3) -5 (4) $2\sqrt[3]{6}$
 (5) $6\sqrt[4]{2}$ (6) $3\sqrt{2}$ (7) 9 (8) 4 (9) 6
 (10) $2\sqrt[4]{27}$ (11) 6 (12) 1 (13) -3

8 次の式を計算せよ。

- (1) $2\sqrt[4]{5} + 3\sqrt[4]{5}$ (2) $\sqrt[3]{81} - \sqrt[3]{24}$ (3) $\sqrt[3]{16} - \sqrt[3]{128}$
 (4) $\sqrt[3]{24} + \sqrt[3]{81} - \sqrt[3]{3}$ (5) $\sqrt[3]{192} - \sqrt[3]{81} + \frac{1}{\sqrt[3]{9}}$ (6) $\sqrt[3]{54} + \sqrt[3]{16} - \sqrt[3]{\frac{1}{4}}$
 (7) $2\sqrt[4]{5} + 3\sqrt[4]{5}$ (8) $\sqrt[3]{81} - \sqrt[3]{24}$ (9) $\sqrt[4]{32} + \sqrt[4]{2} - \sqrt[4]{512}$
 (10) $\sqrt[3]{-24} + \sqrt[3]{81} + \sqrt[3]{-3}$ (11) $\sqrt[4]{32} + \sqrt[4]{162} - \sqrt[4]{512}$
 (12) $\sqrt[3]{54} + \sqrt[3]{2} - \sqrt[3]{16}$ (13) $\sqrt[3]{54} + \frac{3}{2}\sqrt[5]{4} + \sqrt[3]{-\frac{1}{4}}$

- 解答** (1) $5\sqrt[4]{5}$ (2) $\sqrt[3]{3}$ (3) $-2\sqrt[3]{2}$ (4) $4\sqrt[3]{3}$ (5) $\frac{4\sqrt[3]{3}}{3}$ (6) $\frac{9\sqrt[3]{2}}{2}$
 (7) 0 (8) $5\sqrt[4]{5}$ (9) $\sqrt[3]{3}$ (10) $-\sqrt[4]{2}$ (11) $\sqrt[4]{2}$ (12) $2\sqrt[3]{2}$
 (13) $4\sqrt[3]{2}$

9 次の式を計算せよ。

- (1) $(\sqrt[4]{6} + \sqrt[4]{5})(\sqrt[4]{6} - \sqrt[4]{5})$ (2) $(5^{\frac{1}{3}} + 3^{\frac{1}{3}})(5^{\frac{2}{3}} - 5^{\frac{1}{3}}3^{\frac{1}{3}} + 3^{\frac{2}{3}})$
 (3) $(\sqrt[3]{4} + \sqrt[3]{2})^3 + (\sqrt[3]{4} - \sqrt[3]{2})^3$

- 解答** (1) $\sqrt{6} - \sqrt{5}$ (2) 8 (3) $8 + 12\sqrt[3]{2}$