第４章 1.「累乗根」「指数の拡張」 第２回

解答

1. (1) 5　(2) 3　(3) 2

2. (1) 1　(2) $\frac{1}{27}$　(3) 25

(4) $\frac{1}{64}$　(5) 9　(6) $\frac{1}{4}$

(7) 3　(8) 36　(9) 192

3. (1) $3^{\frac{1}{4}}$　(2) $2^{\frac{1}{6}}$　(3) $2^{-\frac{1}{3}}$

4. (1) $\sqrt[3]{a^2}$　(2) $\sqrt[5]{a^2}$　(3) $\sqrt[4]{a^3}$

(4) $\sqrt[6]{a}$　(5) $\sqrt[6]{a^5}$　(6) $\sqrt[6]{a}$

解説

1. (1) 与式 $= 5$

(2) 与式 $= \sqrt[5]{3^2 \times 3^3} = \sqrt[5]{3^5} = (\sqrt[5]{3})^5 = 3$

(3) 与式 $= \sqrt[4]{2}\sqrt[4]{2^3} = \sqrt[4]{2 \times 2^3} = \sqrt[4]{2^4} = (\sqrt[4]{2})^4 = 2$

2. (1) 与式 $= 1$

(2) 与式 $= \frac{1}{3^3} = \frac{1}{27}$

(3) 与式 $= 5^2 = 25$

(4) 与式 $= \frac{1}{\left(2^3\right)^2} = \frac{1}{2^6} = \frac{1}{64}$

(5) 与式 $= 3^{4+(-2)} = 3^2 = 9$

(6) 与式 $= 2^{4-6} = 2^{-2} = \frac{1}{4}$

(7) 与式 $= 3^5 \times (3^{-1})^4 = 3^5 \times 3^{-4} = 3^{5-4} = 3$

(8) 与式 $= (2^2 \times 3)^2 \times 2^{-2} = 2^4 \times 3^2 \times 2^{-2} = 2^{4-2} \times 3^2 = 4 \times 9 = 36$

(9) 与式 $= (2 \times 3)^3 \times 2^3 \times (3^{-1})^2 = 2^3 \times 3^3 \times 2^3 \times 3^{-2} = 2^{3+3} \times 3^{3-2} = 64 \times 3 = 192$

3. (1) 与式 $= 3^{\frac{1}{4}}$

(2) 与式 $= \left(2^{\frac{1}{2}}\right)^{\frac{1}{3}} = 2^{\frac{1}{2} \times \frac{1}{3}} = 2^{\frac{1}{6}}$

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

4. (1) 与式 $= \sqrt[3]{a^2}$

(2) 与式 $= a^{\frac{4}{10}} = a^{\frac{2}{5}} = \sqrt[5]{a^2}$

(3) 与式 $= a^{\frac{1}{2}+\frac{1}{4}} = a^{\frac{3}{4}} = \sqrt[4]{a^3}$

(4) 与式 $= a^{\frac{1}{3}-\frac{1}{6}} = a^{\frac{1}{6}} = \sqrt[6]{a}$

(5) 与式 $= a^{\frac{1}{3}+\frac{1}{2}} = a^{\frac{5}{6}} = \sqrt[6]{a^5}$

(6) 与式 $= a^{\frac{1}{2}-\frac{1}{3}} = a^{\frac{1}{6}} = \sqrt[6]{a}$