第４章 1.「累乗根」「指数の拡張」 第１回

解答

1. (1) 4　(2) 2　(3) 3

2. (1) 1　(2) $\frac{1}{16}$　(3) 2

(4) $\frac{1}{9}$　(5) 5　(6) $\frac{1}{3}$

(7) $\frac{1}{2}$　(8) 24　(9) 81

3. (1) $2^{\frac{1}{3}}$　(2) $3^{\frac{1}{4}}$　(3) $7^{-\frac{1}{2}}$

4. (1) $\sqrt{a}$　(2) $\sqrt[4]{a}$　(3) $\sqrt[6]{a^5}$

(4) $\frac{1}{\sqrt[3]{a}}$　(5) $\sqrt[12]{a^7}$　(6) $\frac{1}{\sqrt[3]{a^2}}$

解説

1. (1) 与式 $= 4$

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

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

2. (1) 与式 $= 1$

(2) 与式 $= \frac{1}{4^2} = \frac{1}{16}$

(3) 与式 $= 2^1 = 2$

(4) 与式 $= \frac{1}{(3^2)^1} = \frac{1}{3^2} = \frac{1}{9}$

(5) 与式 $= 5^{3+(-2)} = 5^1 = 5$

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

(7) 与式 $= 2^3 \times (2^{-1})^4 = 2^3 \times 2^{-4} = 2^{3-4} = 2^{-1} = \frac{1}{2}$

(8) 与式 $= (2 \times 3)^3 \times 3^{-2} = 2^3 \times 3^3 \times 3^{-2} = 2^3 \times 3^{3-2} = 8 \times 3 = 24$

(9) 与式 $= (2^2 \times 3)^2 \times 3^2 \times (2^{-1})^4 = 2^4 \times 3^2 \times 3^2 \times 2^{-4} = 2^{4-4} \times 3^{2+2} = 1 \times 81 = 81$

3. (1) 与式 $= 2^{\frac{1}{3}}$

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

(3) 与式 $= \frac{1}{7^{\frac{1}{2}}} = 7^{-\frac{1}{2}}$

4. (1) 与式 $= \sqrt{a}$

(2) 与式 $= a^{\frac{25}{100}} = a^{\frac{1}{4}} = \sqrt[4]{a}$

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

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

(5) 与式 $= a^{\frac{1}{3}+\frac{1}{4}} = a^{\frac{7}{12}} = \sqrt[12]{a^7}$

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