

第1章 3. 「分数式の計算」「平方根」 第5回

解答

1. (1) $\frac{3y^3}{2x}$ (2) $\frac{s+t}{s-t}$ (3) $\frac{x+3}{x-2}$
 2. (1) $\frac{4x}{(x-1)(x+3)}$ (2) $\frac{1}{st}$ (3) $\frac{4}{x(x+2)^2}$
 3. (1) $\frac{5z^2}{4xy^2}$ (2) $\frac{(t-3)(t+1)}{(t+2)^2}$
 4. (1) $\sqrt{3}$ (2) $-3-11\sqrt{15}$ (3) $37+8\sqrt{10}$
 5. (1) $\frac{2\sqrt{15}}{3}$ (2) $\frac{\sqrt{7}-\sqrt{3}}{4}$ (3) $\frac{2+\sqrt{2}}{2}$

解説

1. (1) 与式 = $\frac{27x^3y^9z^6}{18x^4y^6z^6} = \frac{3y^3}{2x}$ (2) 与式 = $\frac{st(s+t)}{st(s-t)} = \frac{s+t}{s-t}$
 (3) 与式 = $\frac{(x+3)(x-2)}{(x-2)^2} = \frac{x+3}{x-2}$
 2. (1) 与式 = $\frac{x+3}{(x-1)(x+3)} + \frac{3(x-1)}{(x-1)(x+3)} = \frac{x+3}{(x-1)(x+3)} + \frac{3x-3}{(x-1)(x+3)} = \frac{4x}{(x-1)(x+3)}$
 (2) 与式 = $\frac{2}{t(2s+t)} + \frac{1}{s(2s+t)} = \frac{2s}{st(2s+t)} + \frac{t}{st(2s+t)} = \frac{2s+t}{st(2s+t)} = \frac{1}{st}$
 (3) 与式 = $\frac{2}{x(x+2)} - \frac{2}{(x+2)^2} = \frac{2(x+2)}{x(x+2)^2} - \frac{2x}{x(x+2)^2} = \frac{2x+4}{x(x+2)^2} - \frac{2x}{x(x+2)^2} = \frac{4}{x(x+2)^2}$
 3. (1) 与式 = $\frac{x^3}{10y^4z} \times \frac{25y^2z^3}{2x^4} = \frac{1}{2y^2} \times \frac{5z^2}{2x} = \frac{5z^2}{4xy^2}$
 (2) 与式 = $\frac{(t+4)(t-3)}{(t+2)(t-1)} \times \frac{(t-1)(t+1)}{(t+2)(t+4)} = \frac{t-3}{t+2} \times \frac{t+1}{t+2} = \frac{(t-3)(t+1)}{(t+2)^2}$
 4. (1) 与式 = $3\sqrt{3} - 6\sqrt{3} + 4\sqrt{3} = \sqrt{3}$
 (2) 与式 = $4(\sqrt{3})^2 - 12\sqrt{15} + \sqrt{15} - 3(\sqrt{5})^2 = 4 \times 3 - 11\sqrt{15} - 3 \times 5 = -3 - 11\sqrt{15}$
 (3) 与式 = $(\sqrt{5})^2 + 2 \times 4\sqrt{10} + (4\sqrt{2})^2 = 5 + 8\sqrt{10} + 16 \times 2 = 37 + 8\sqrt{10}$
 5. (1) 与式 = $\frac{10\sqrt{3}}{3\sqrt{5}} \times \frac{\sqrt{5}}{\sqrt{5}} = \frac{10\sqrt{3}\sqrt{5}}{3(\sqrt{5})^2} = \frac{10\sqrt{15}}{3 \times 5} = \frac{2\sqrt{15}}{3}$
 (2) 与式 = $\frac{\sqrt{7}-\sqrt{3}}{(\sqrt{7}+\sqrt{3})(\sqrt{7}-\sqrt{3})} = \frac{\sqrt{7}-\sqrt{3}}{(\sqrt{7})^2 - (\sqrt{3})^2} = \frac{\sqrt{7}-\sqrt{3}}{7-3} = \frac{\sqrt{7}-\sqrt{3}}{4}$
 (3) 与式 = $\frac{(\sqrt{2}-1)(3\sqrt{2}+4)}{(3\sqrt{2}-4)(3\sqrt{2}+4)} = \frac{3(\sqrt{2})^2 + 4\sqrt{2} - 3\sqrt{2} - 4}{(3\sqrt{2})^2 - 4^2} = \frac{3 \times 2 + \sqrt{2} - 4}{18 - 16} = \frac{2+\sqrt{2}}{2}$