

平方根の加減（有理化してから計算）

例題 次の計算をせよ。（有理化して計算）

(1) $\frac{2}{\sqrt{3}} - \frac{\sqrt{3}}{3}$

(2) $\sqrt{96} - \sqrt{\frac{2}{3}}$

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

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練習 次の計算をせよ。

(1) $\frac{1}{\sqrt{2}} - \frac{3\sqrt{2}}{2}$

(3) $\sqrt{18} - \frac{1}{\sqrt{2}}$

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(2) $\frac{2}{\sqrt{2}} - \frac{6}{\sqrt{3}}$

(4) $\sqrt{\frac{3}{5}} + \frac{2\sqrt{5}}{\sqrt{3}}$

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例題 次の計算をせよ。（有理化して計算）

(1) $\frac{2}{\sqrt{3}} - \frac{\sqrt{3}}{3}$

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$$\begin{aligned} \frac{2}{\sqrt{3}} - \frac{\sqrt{3}}{3} &= \frac{2 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} - \frac{\sqrt{3}}{3} \\ &= \frac{2\sqrt{3}}{3} - \frac{\sqrt{3}}{3} \\ &= \frac{\sqrt{3}}{3} \end{aligned}$$

答 $\frac{\sqrt{3}}{3}$

(2) $\sqrt{96} - \sqrt{\frac{2}{3}}$

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$$\begin{aligned} \sqrt{96} - \sqrt{\frac{2}{3}} &= 4\sqrt{6} - \frac{\sqrt{2}}{\sqrt{3}} \\ &= 4\sqrt{6} - \frac{\sqrt{2} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ &= 4\sqrt{6} - \frac{\sqrt{6}}{3} \\ &= \frac{12\sqrt{6}}{3} - \frac{\sqrt{6}}{3} \\ &= \frac{11\sqrt{6}}{3} \end{aligned}$$

答 $\frac{11\sqrt{6}}{3}$

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

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$$\begin{aligned} \frac{\sqrt{5}}{\sqrt{3}} - \frac{\sqrt{3}}{\sqrt{5}} &= \frac{\sqrt{5} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} - \frac{\sqrt{3} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} \\ &= \frac{\sqrt{15}}{3} - \frac{\sqrt{15}}{5} \\ &= \frac{5\sqrt{15}}{15} - \frac{3\sqrt{15}}{15} \\ &= \frac{2\sqrt{15}}{15} \end{aligned}$$

答 $\frac{2\sqrt{15}}{15}$

練習 次の計算をせよ。

(1) $\frac{1}{\sqrt{2}} - \frac{3\sqrt{2}}{2}$

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$$\begin{aligned} \frac{1}{\sqrt{2}} - \frac{3\sqrt{2}}{2} &= \frac{1 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} - \frac{3\sqrt{2}}{2} \\ &= \frac{\sqrt{2}}{2} - \frac{3\sqrt{2}}{2} \\ &= -\frac{2\sqrt{2}}{2} \\ &= -\sqrt{2} \end{aligned}$$

答 $-\sqrt{2}$

(2) $\frac{2}{\sqrt{2}} - \frac{6}{\sqrt{3}}$

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$$\begin{aligned} \frac{2}{\sqrt{2}} - \frac{6}{\sqrt{3}} &= \frac{2 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} - \frac{6 \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ &= \frac{2\sqrt{2}}{2} - \frac{6\sqrt{3}}{3} \\ &= \sqrt{2} - 2\sqrt{3} \end{aligned}$$

答 $\sqrt{2} - 2\sqrt{3}$

(3) $\sqrt{18} - \frac{1}{\sqrt{2}}$

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$$\begin{aligned} \sqrt{18} - \frac{1}{\sqrt{2}} &= 3\sqrt{2} - \frac{1 \times \sqrt{2}}{\sqrt{2} \times \sqrt{2}} \\ &= 3\sqrt{2} - \frac{\sqrt{2}}{2} \\ &= \frac{6\sqrt{2}}{2} - \frac{\sqrt{2}}{2} \\ &= \frac{5\sqrt{2}}{2} \end{aligned}$$

答 $\frac{5\sqrt{2}}{2}$

(4) $\sqrt{\frac{3}{5}} + \frac{2\sqrt{5}}{\sqrt{3}}$

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$$\begin{aligned} \sqrt{\frac{3}{5}} + \frac{2\sqrt{5}}{\sqrt{3}} &= \frac{\sqrt{3}}{\sqrt{5}} + \frac{2\sqrt{5}}{\sqrt{3}} \\ &= \frac{\sqrt{3} \times \sqrt{5}}{\sqrt{5} \times \sqrt{5}} + \frac{2\sqrt{5} \times \sqrt{3}}{\sqrt{3} \times \sqrt{3}} \\ &= \frac{\sqrt{15}}{5} + \frac{2\sqrt{15}}{3} \\ &= \frac{3\sqrt{15}}{15} + \frac{10\sqrt{15}}{15} \\ &= \frac{13\sqrt{15}}{15} \end{aligned}$$

答 $\frac{13\sqrt{15}}{15}$