次の式を計算せよ.

$$\frac{\sqrt{7}}{\sqrt{5}+\sqrt{3}}-\frac{2\sqrt{5}}{\sqrt{7}+\sqrt{3}}+\frac{\sqrt{3}}{\sqrt{7}+\sqrt{5}}$$

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【答】 0

【解答】

分母を有理化して式を整理すると

$$\begin{aligned}
&\frac{\sqrt{7}}{\sqrt{5}+\sqrt{3}}-\frac{2\sqrt{5}}{\sqrt{7}+\sqrt{3}}+\frac{\sqrt{3}}{\sqrt{7}+\sqrt{5}}\\
&=\frac{\sqrt{7}(\sqrt{5}-\sqrt{3})}{(\sqrt{5}+\sqrt{3})(\sqrt{5}-\sqrt{3})}-\frac{2\sqrt{5}(\sqrt{7}-\sqrt{3})}{(\sqrt{7}+\sqrt{3})(\sqrt{7}-\sqrt{3})}+\frac{\sqrt{3}(\sqrt{7}-\sqrt{5})}{(\sqrt{7}+\sqrt{5})(\sqrt{7}-\sqrt{5})}\\
&=\frac{\sqrt{35}-\sqrt{21}}{5-3}-\frac{2(\sqrt{35}-\sqrt{15})}{7-3}+\frac{\sqrt{21}-\sqrt{15}}{7-5}\\
&=\frac{(\sqrt{35}-\sqrt{21})-(\sqrt{35}-\sqrt{15})+(\sqrt{21}-\sqrt{15})}{2}\\
&=\mathbf{0} \qquad \cdots\cdots(\text{答})
\end{aligned}$$

となる.