

$\frac{5}{2\sqrt{2} + \sqrt{3} + \sqrt{5}}$  の分母を有理化せよ。

(2008 上智大)

解説

$$\begin{aligned}\frac{5}{2\sqrt{2} + \sqrt{3} + \sqrt{5}} &= \frac{5(\sqrt{3} + \sqrt{5} - 2\sqrt{2})}{(\sqrt{3} + \sqrt{5} + 2\sqrt{2})(\sqrt{3} + \sqrt{5} - 2\sqrt{2})} \\ &= \frac{5(\sqrt{3} + \sqrt{5} - 2\sqrt{2})}{(\sqrt{3} + \sqrt{5})^2 - (2\sqrt{2})^2} \\ &= \frac{5(\sqrt{3} + \sqrt{5} - 2\sqrt{2})}{2\sqrt{15}} \\ &= \frac{5(3\sqrt{5} + 5\sqrt{3} + \sqrt{30})}{30} \\ &= \frac{3\sqrt{5} + 5\sqrt{3} - 2\sqrt{30}}{6}\end{aligned}$$