

分母を有理化せよ。

$$\begin{aligned}(1) \quad \frac{1}{\sqrt{3}+1} &= \frac{1}{\sqrt{3}+1} \times \frac{\sqrt{3}-1}{\sqrt{3}-1} \\ &= \frac{\sqrt{3}-1}{(\sqrt{3})^2-1^2} = \frac{\sqrt{3}-1}{3-1} \\ &= \frac{\sqrt{3}-1}{2}\end{aligned}$$

$$\begin{aligned}(2) \quad \frac{1}{3+\sqrt{2}} &= \frac{1}{3+\sqrt{2}} \times \frac{3-\sqrt{2}}{3-\sqrt{2}} \\ &= \frac{3-\sqrt{2}}{3^2-(\sqrt{2})^2} = \frac{3-\sqrt{2}}{9-2} \\ &= \frac{3-\sqrt{2}}{7}\end{aligned}$$

$$\begin{aligned}(3) \quad \frac{1}{\sqrt{3}+\sqrt{2}} &= \frac{1}{\sqrt{3}+\sqrt{2}} \times \frac{\sqrt{3}-\sqrt{2}}{\sqrt{3}-\sqrt{2}} \\ &= \frac{\sqrt{3}-\sqrt{2}}{(\sqrt{3})^2-(\sqrt{2})^2} = \frac{\sqrt{3}-\sqrt{2}}{3-2} \\ &= \frac{\sqrt{3}-\sqrt{2}}{1} = \sqrt{3}-\sqrt{2}\end{aligned}$$

$$\begin{aligned}(4) \quad \frac{1}{\sqrt{2}-1} &= \frac{1}{\sqrt{2}-1} \times \frac{\sqrt{2}+1}{\sqrt{2}+1} \\ &= \frac{\sqrt{2}+1}{(\sqrt{2})^2-1^2} = \frac{\sqrt{2}+1}{2-1} \\ &= \frac{\sqrt{2}+1}{1} = \sqrt{2}+1\end{aligned}$$

$$\begin{aligned}(5) \quad \frac{1}{2-\sqrt{2}} &= \frac{1}{2-\sqrt{2}} \times \frac{2+\sqrt{2}}{2+\sqrt{2}} \\ &= \frac{2+\sqrt{2}}{2^2-(\sqrt{2})^2} = \frac{2+\sqrt{2}}{4-2} \\ &= \frac{2+\sqrt{2}}{2}\end{aligned}$$

$$\begin{aligned}(6) \quad \frac{3}{\sqrt{2}+1} &= \frac{3}{\sqrt{2}+1} \times \frac{\sqrt{2}-1}{\sqrt{2}-1} \\ &= \frac{3(\sqrt{2}-1)}{(\sqrt{2})^2-1^2} = \frac{3\sqrt{2}-3}{2-1} \\ &= \frac{3\sqrt{2}-3}{1} = 3\sqrt{2}-3\end{aligned}$$

$$\begin{aligned}(7) \quad \frac{2}{2+\sqrt{3}} &= \frac{2}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} \\ &= \frac{2(2-\sqrt{3})}{2^2-(\sqrt{3})^2} = \frac{4-2\sqrt{3}}{4-3} \\ &= \frac{4-2\sqrt{3}}{1} = 4-2\sqrt{3}\end{aligned}$$

$$\begin{aligned}(8) \quad \frac{\sqrt{2}}{\sqrt{2}-1} &= \frac{\sqrt{2}}{\sqrt{2}-1} \times \frac{\sqrt{2}+1}{\sqrt{2}+1} \\ &= \frac{\sqrt{2}(\sqrt{2}+1)}{(\sqrt{2})^2-1^2} = \frac{2+\sqrt{2}}{2-1} \\ &= \frac{2+\sqrt{2}}{1} = 2+\sqrt{2}\end{aligned}$$

$$\begin{aligned}(9) \quad \frac{\sqrt{3}}{2+\sqrt{3}} &= \frac{\sqrt{3}}{2+\sqrt{3}} \times \frac{2-\sqrt{3}}{2-\sqrt{3}} \\ &= \frac{\sqrt{3}(2-\sqrt{3})}{2^2-(\sqrt{3})^2} = \frac{2\sqrt{3}-3}{4-3} \\ &= \frac{2\sqrt{3}-3}{1} = 2\sqrt{3}-3\end{aligned}$$

$$\begin{aligned}(10) \quad \frac{\sqrt{2}}{\sqrt{3}-\sqrt{2}} &= \frac{\sqrt{2}}{\sqrt{3}-\sqrt{2}} \times \frac{\sqrt{3}+\sqrt{2}}{\sqrt{3}+\sqrt{2}} \\ &= \frac{\sqrt{2}(\sqrt{3}+\sqrt{2})}{(\sqrt{3})^2-(\sqrt{2})^2} = \frac{\sqrt{6}+2}{3-2} \\ &= \frac{\sqrt{6}+2}{1} = \sqrt{6}+2\end{aligned}$$