

Ba	式の計算編	正答・解説
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正 答

問題 番号	解 答 記 号	正 解
1.	$\frac{1}{(1+\sqrt{6})-\text{ア}}$	$\frac{1}{(1+\sqrt{6})-3}$
	$\frac{\sqrt{6}-\text{イ}}{\text{ウ}}$	$\frac{\sqrt{6}-2}{4}$
	$\text{エ}+\text{オ}\sqrt{6}$	$2+2\sqrt{6}$
	$\frac{\text{カ}-\sqrt{6}}{\text{キ}}$	$\frac{4-\sqrt{6}}{2}$

問題 番号	解 答 記 号	正 解
2.	ア	2
	$\text{イ}(\text{ウエ}+\sqrt{\text{オ}})$	$2(-1+\sqrt{6})$
	$\text{カ}(\text{キ}-\sqrt{\text{ク}})$	$8(3-\sqrt{6})$
	ケコ	16
	$a^4+\text{サ}a^3-\text{シ}sa^2+\text{セ}a+\text{ソ}=0$	$a^4+4a^3-16a^2+8a+4=0$

解 説

1.

$$\begin{aligned}
 AB &= \frac{1}{1+\sqrt{6}+\sqrt{3}} \cdot \frac{1}{1+\sqrt{6}-\sqrt{3}} \\
 &= \frac{1}{(1+\sqrt{6})^2 - (\sqrt{3})^2} = \frac{1}{(1+\sqrt{6})^2 - 3} \\
 &= \frac{1}{1+2\sqrt{6}+6-3} = \frac{1}{4+2\sqrt{6}} \\
 &= \frac{1}{2(2+\sqrt{6})} = \frac{2-\sqrt{6}}{2(4-6)} = \frac{2-\sqrt{6}}{2 \cdot (-2)} \\
 &= \frac{2-\sqrt{6}}{-4} = \frac{\sqrt{6}-2}{4} \\
 \frac{1}{A} &= 1+\sqrt{3}+\sqrt{6}, \quad \frac{1}{B} = 1-\sqrt{3}+\sqrt{6} \quad \text{だから} \\
 \frac{1}{A} + \frac{1}{B} &= 1+\sqrt{3}+\sqrt{6}+1-\sqrt{3}+\sqrt{6} \\
 &= \underline{2+2\sqrt{6}} \\
 \frac{1}{A} + \frac{1}{B} &= \frac{B}{AB} + \frac{A}{AB} = \frac{A+B}{AB} \quad \text{より、} \\
 A+B &= \left(\frac{1}{A} + \frac{1}{B} \right) \cdot AB \\
 &= (2+2\sqrt{6}) \cdot \frac{\sqrt{6}-2}{4} \\
 &= \frac{\cancel{1}2(\sqrt{6}+1)(\sqrt{6}-2)}{\cancel{4}_2} \\
 &= \frac{6-\sqrt{6}-2}{2} = \underline{\frac{4-\sqrt{6}}{2}}
 \end{aligned}$$

2.

$$\begin{aligned}
 (1) \quad a &= \frac{1+\sqrt{3}}{1+\sqrt{2}}, \quad b = \frac{1-\sqrt{3}}{1-\sqrt{2}} \quad \text{より} \\
 ab &= \frac{1+\sqrt{3}}{1+\sqrt{2}} \cdot \frac{1-\sqrt{3}}{1-\sqrt{2}} = \frac{1-3}{1-2} = \frac{-2}{-1} = \underline{2} \\
 a+b &= \frac{1+\sqrt{3}}{1+\sqrt{2}} + \frac{1-\sqrt{3}}{1-\sqrt{2}} \\
 &= \frac{(1+\sqrt{3})(1-\sqrt{2})}{1-2} + \frac{(1-\sqrt{3})(1+\sqrt{2})}{1-2} \\
 &= -(1-\sqrt{2}+\sqrt{3}-\sqrt{6}) - (1+\sqrt{2}-\sqrt{3}-\sqrt{6}) \\
 &= -1+\sqrt{2}-\sqrt{3}+\sqrt{6}-1-\sqrt{2}+\sqrt{3}+\sqrt{6} \\
 &= -2+2\sqrt{6} = \underline{2(-1+\sqrt{6})} \\
 a^2+b^2 &= (a+b)^2 - 2ab \\
 &= (-2+2\sqrt{6})^2 - 2 \cdot 2 \\
 &= 4-8\sqrt{6}+24-4 \\
 &= 24-8\sqrt{6} = \underline{8(3-\sqrt{6})} \\
 (2) \quad a^2+b^2+4(a+b) &= (24-8\sqrt{6})+4(-2+2\sqrt{6}) \\
 &= 24-8\sqrt{6}-8+8\sqrt{6} = \underline{16} \\
 ab &= 2 \quad \text{より、} \quad b = \frac{2}{a} \quad \text{を} \\
 a^2+b^2+4(a+b) &= 16 \quad \text{へ代入} \\
 a^2 + \frac{4}{a^2} + 4a + \frac{8}{a} &= 16 \\
 \text{両辺} \times a^2 & \\
 a^4 + 4 + 4a^3 + 8a &= 16a^2 \\
 \underline{a^4 + 4a^3 - 16a^2 + 8a + 4} &= 0
 \end{aligned}$$