

⑤

$$\left[\begin{array}{ccc|cc} 3 & 6 & 1 & 1 \\ 5 & 5 & 3 & 1+\lambda \\ 6-\lambda & 4 & 6-\lambda^2 & 3 \end{array} \right]$$

$$\begin{aligned}
 \det(M) &= 15(6-\lambda^2) - 12(6+\lambda^2) + 20 \\
 &\quad - 5(6+\lambda^2) - 36 - 30(6-\lambda^2) \\
 &= -15(6-\lambda^2) + 12(6+\lambda^2) - 16 = \\
 &= 28\lambda^2 - 106 + 78 = 28\lambda^2 - 28 \\
 &= 28(\lambda^2 - 1) = 0 \quad (\text{根}\mathbb{Z}_2)
 \end{aligned}$$

$$\left| \begin{array}{ccc|c} 1 & 5 & 1 & 0 \\ 1+\lambda & 5 & 3 & 1+\lambda \\ 3 & 4 & 6-\lambda^2 & 0 \end{array} \right| = 5(6-\lambda^2) + 54 \cancel{+ 4(1+\lambda)} - 15 - 12 - 6(6-\lambda^2)(1+\lambda) = 6\lambda^3 + \lambda^2 - 32\lambda + 25$$

$$\begin{aligned}
 &(2-\lambda)(6\lambda^2 + 7\lambda - 25) = \\
 &= (2-\lambda)(6\lambda^2 - 25) \\
 &= (2-\lambda)(-\lambda^2 + 25)
 \end{aligned}$$