

6.16

$$\begin{aligned}
 1) \quad \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} &= \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} \\
 &= \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left(\left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} \right) \\
 &= \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} + \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} \\
 &= \lambda(\lambda-1)^5 - \lambda(\lambda-1)^4 - \lambda(\lambda-1)^4 + \lambda(\lambda-1)^3 \\
 &= \lambda(\lambda-1)^3 \left((\lambda-1)^2 - (\lambda-1) - (\lambda-1) + 1 \right) \\
 &= \lambda(\lambda-1)^3 \left((\lambda-1)^2 - 2(\lambda-1) + 1 \right) \\
 &= \lambda(\lambda-1)^3 \left((\lambda-1) - 1 \right)^2 \\
 &= \lambda(\lambda-1)^3 (\lambda-2)^2
 \end{aligned}$$

$$\begin{aligned}
 2) \quad \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} &= \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} \\
 &= \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left(\left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} \right) \\
 &= \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} - \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} + \left\{ \begin{array}{c} \bullet \\ \diagup \quad \diagdown \\ \bullet \quad \bullet \\ \diagdown \quad \diagup \\ \bullet \end{array} \right\} \\
 &= \lambda(\lambda-1)^4 - \lambda(\lambda-1)^3 + \lambda(\lambda-1)(\lambda-2) \\
 &= \lambda(\lambda-1) \underbrace{\left((\lambda-1)^3 - (\lambda-1)^2 + (\lambda-2) \right)}_{(\lambda-1)^2((\lambda-1)-1)} \\
 &= \lambda(\lambda-1) \left((\lambda-1)^2(\lambda-2) + (\lambda-2) \right) \\
 &= \lambda(\lambda-1)(\lambda-2) \left((\lambda-1)^2 + 1 \right) \\
 &= \lambda(\lambda-1)(\lambda-2)(\lambda^2 - 2\lambda + 2)
 \end{aligned}$$