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$$A := \text{Matrix} \left(\left[\left[-(\lambda 1 + \lambda 2), \frac{\mu 1^2}{\lambda 2}, \frac{\mu 2^2}{\lambda 1} \right], \left[\lambda 1, -\frac{\mu 1 \cdot (\lambda 2 + \mu 1)}{\lambda 2}, \mu 2 \right], \left[1, 1 + \frac{\mu 1}{\lambda 2}, 1 + \frac{\mu 2}{\lambda 1} \right] \right] \right)$$

$$A := \begin{bmatrix} -\lambda 1 - \lambda 2 & \frac{\mu 1^2}{\lambda 2} & \frac{\mu 2^2}{\lambda 1} \\ \lambda 1 & -\frac{\mu 1 (\lambda 2 + \mu 1)}{\lambda 2} & \mu 2 \\ 1 & 1 + \frac{\mu 1}{\lambda 2} & 1 + \frac{\mu 2}{\lambda 1} \end{bmatrix} \quad (1)$$

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> Det(A)
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$$\text{Det} \left(\begin{bmatrix} -\lambda 1 - \lambda 2 & \frac{\mu 1^2}{\lambda 2} & \frac{\mu 2^2}{\lambda 1} \\ \lambda 1 & -\frac{\mu 1 (\lambda 2 + \mu 1)}{\lambda 2} & \mu 2 \\ 1 & 1 + \frac{\mu 1}{\lambda 2} & 1 + \frac{\mu 2}{\lambda 1} \end{bmatrix} \right) \quad (2)$$

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> det(A)
```

$$\det \left(\begin{bmatrix} -\lambda 1 - \lambda 2 & \frac{\mu 1^2}{\lambda 2} & \frac{\mu 2^2}{\lambda 1} \\ \lambda 1 & -\frac{\mu 1 (\lambda 2 + \mu 1)}{\lambda 2} & \mu 2 \\ 1 & 1 + \frac{\mu 1}{\lambda 2} & 1 + \frac{\mu 2}{\lambda 1} \end{bmatrix} \right) \quad (3)$$

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> simplify(%)
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$$\det \left(\begin{bmatrix} -\lambda 1 - \lambda 2 & \frac{\mu 1^2}{\lambda 2} & \frac{\mu 2^2}{\lambda 1} \\ \lambda 1 & -\frac{\mu 1 (\lambda 2 + \mu 1)}{\lambda 2} & \mu 2 \\ 1 & \frac{\lambda 2 + \mu 1}{\lambda 2} & \frac{\lambda 1 + \mu 2}{\lambda 1} \end{bmatrix} \right) \quad (4)$$

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> DET_BASE := linalg[det](A);
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$$DET_BASE := \frac{1}{\lambda 2 \lambda 1} (\lambda 1^2 \lambda 2 \mu 1 + \lambda 1^2 \lambda 2 \mu 2 + \lambda 1^2 \mu 1 \mu 2 + \lambda 1 \lambda 2^2 \mu 1 + \lambda 1 \lambda 2^2 \mu 2 + \lambda 1 \lambda 2 \mu 1^2 + 2 \lambda 1 \lambda 2 \mu 1 \mu 2 + \lambda 1 \lambda 2 \mu 2^2 + \lambda 1 \mu 1^2 \mu 2 + \lambda 1 \mu 1 \mu 2^2 + \lambda 2^2 \mu 1 \mu 2 + \lambda 2 \mu 1^2 \mu 2 + \lambda 2 \mu 1 \mu 2^2 + \mu 1^2 \mu 2^2) \quad (5)$$

$$\begin{aligned} &> A_1 := Matrix\left(\left[\left[0, \frac{\mu 1^2}{\lambda 2}, \frac{\mu 2^2}{\lambda 1}\right], \left[0, -\frac{\mu 1 \cdot (\lambda 2 + \mu 1)}{\lambda 2}, \mu 2\right], \left[1, 1 + \frac{\mu 1}{\lambda 2}, 1 + \frac{\mu 2}{\lambda 1}\right]\right]\right) \\ &A_1 := \begin{bmatrix} 0 & \frac{\mu 1^2}{\lambda 2} & \frac{\mu 2^2}{\lambda 1} \\ 0 & -\frac{\mu 1 (\lambda 2 + \mu 1)}{\lambda 2} & \mu 2 \\ 1 & 1 + \frac{\mu 1}{\lambda 2} & 1 + \frac{\mu 2}{\lambda 1} \end{bmatrix} \end{aligned} \quad (6)$$

$$\begin{aligned} &> P0 := \frac{linalg[det](A_1)}{DET_BASE} \\ P0 &:= (\mu 1 \mu 2 (\lambda 1 \mu 1 + \lambda 2 \mu 2 + \mu 1 \mu 2)) / (\lambda 1^2 \lambda 2 \mu 1 + \lambda 1^2 \lambda 2 \mu 2 + \lambda 1^2 \mu 1 \mu 2 + \lambda 1 \lambda 2^2 \mu 1 + \lambda 1 \lambda 2^2 \mu 2 + \lambda 1 \lambda 2 \mu 1^2 + 2 \lambda 1 \lambda 2 \mu 1 \mu 2 + \lambda 1 \lambda 2 \mu 2^2 + \lambda 1 \mu 1^2 \mu 2 + \lambda 1 \mu 1 \mu 2^2 + \lambda 2^2 \mu 1 \mu 2 + \lambda 2 \mu 1^2 \mu 2 + \lambda 2 \mu 1 \mu 2^2 + \mu 1^2 \mu 2^2) \end{aligned} \quad (7)$$

$$\begin{aligned} &> A_3 := Matrix\left(\left[\left[-(\lambda 1 + \lambda 2), 0, \frac{\mu 2^2}{\lambda 1}\right], [\lambda 1, 0, \mu 2], \left[1, 1, 1 + \frac{\mu 2}{\lambda 1}\right]\right]\right) \\ A_3 &:= \begin{bmatrix} -\lambda 1 - \lambda 2 & 0 & \frac{\mu 2^2}{\lambda 1} \\ \lambda 1 & 0 & \mu 2 \\ 1 & 1 & 1 + \frac{\mu 2}{\lambda 1} \end{bmatrix} \end{aligned} \quad (8)$$

$$\begin{aligned} &> P3 := \frac{linalg[det](A_3)}{DET_BASE} \\ P3 &:= ((\lambda 1 \mu 2 + \lambda 2 \mu 2 + \mu 2^2) \lambda 2 \lambda 1) / (\lambda 1^2 \lambda 2 \mu 1 + \lambda 1^2 \lambda 2 \mu 2 + \lambda 1^2 \mu 1 \mu 2 + \lambda 1 \lambda 2^2 \mu 1 + \lambda 1 \lambda 2^2 \mu 2 + \lambda 1 \lambda 2 \mu 1^2 + 2 \lambda 1 \lambda 2 \mu 1 \mu 2 + \lambda 1 \lambda 2 \mu 2^2 + \lambda 1 \mu 1^2 \mu 2 + \lambda 1 \mu 1 \mu 2^2 + \lambda 2^2 \mu 1 \mu 2 + \lambda 2 \mu 1^2 \mu 2 + \lambda 2 \mu 1 \mu 2^2 + \mu 1^2 \mu 2^2) \end{aligned} \quad (9)$$

$$\begin{aligned} &> P1 := \frac{\mu 1}{\lambda 2} \cdot P3 \\ P1 &:= (\mu 1 (\lambda 1 \mu 2 + \lambda 2 \mu 2 + \mu 2^2) \lambda 1) / (\lambda 1^2 \lambda 2 \mu 1 + \lambda 1^2 \lambda 2 \mu 2 + \lambda 1^2 \mu 1 \mu 2 + \lambda 1 \lambda 2^2 \mu 1 + \lambda 1 \lambda 2^2 \mu 2 + \lambda 1 \lambda 2 \mu 1^2 + 2 \lambda 1 \lambda 2 \mu 1 \mu 2 + \lambda 1 \lambda 2 \mu 2^2 + \lambda 1 \mu 1^2 \mu 2 + \lambda 1 \mu 1 \mu 2^2 + \lambda 2^2 \mu 1 \mu 2 + \lambda 2 \mu 1^2 \mu 2 + \lambda 2 \mu 1 \mu 2^2 + \mu 1^2 \mu 2^2) \end{aligned} \quad (10)$$

$$\begin{aligned}
& + \lambda^2 \mu_1 \mu_2 + \lambda^2 \mu_1^2 \mu_2 + \lambda^2 \mu_1 \mu_2^2 + \mu_1^2 \mu_2^2) \\
> A_4 := \text{Matrix}\left(\left[\left[\left[-(\lambda_1 + \lambda_2), \frac{\mu_1^2}{\lambda_2}, 0\right], \left[\lambda_1, -\frac{\mu_1 \cdot (\lambda_2 + \mu_1)}{\lambda_2}, 0\right], \left[1, 1 + \frac{\mu_1}{\lambda_2}, 1\right]\right]\right]\right) \\
& A_4 := \begin{bmatrix} -\lambda_1 - \lambda_2 & \frac{\mu_1^2}{\lambda_2} & 0 \\ \lambda_1 & -\frac{\mu_1 (\lambda_2 + \mu_1)}{\lambda_2} & 0 \\ 1 & 1 + \frac{\mu_1}{\lambda_2} & 1 \end{bmatrix} \tag{11}
\end{aligned}$$

$$\begin{aligned}
> P4 &:= \frac{\text{linalg}[det](A_4)}{DET_BASE} \\
P4 &:= (\mu_1 (\lambda_1 + \lambda_2 + \mu_1) \lambda_2 \lambda_1) / (\lambda_1^2 \lambda_2 \mu_1 + \lambda_1^2 \lambda_2 \mu_2 + \lambda_1^2 \mu_1 \mu_2 + \lambda_1 \lambda_2^2 \mu_1 \\
& + \lambda_1 \lambda_2^2 \mu_2 + \lambda_1 \lambda_2 \mu_1^2 + 2 \lambda_1 \lambda_2 \mu_1 \mu_2 + \lambda_1 \lambda_2 \mu_2^2 + \lambda_1 \mu_1^2 \mu_2 + \lambda_1 \mu_1 \mu_2^2 \\
& + \lambda_2^2 \mu_1 \mu_2 + \lambda_2 \mu_1^2 \mu_2 + \lambda_2 \mu_1 \mu_2^2 + \mu_1^2 \mu_2^2) \tag{12}
\end{aligned}$$

$$\begin{aligned}
> P2 &:= \frac{\mu_2}{\lambda_1} \cdot P4 \\
P2 &:= (\mu_2 \mu_1 (\lambda_1 + \lambda_2 + \mu_1) \lambda_2) / (\lambda_1^2 \lambda_2 \mu_1 + \lambda_1^2 \lambda_2 \mu_2 + \lambda_1^2 \mu_1 \mu_2 + \lambda_1 \lambda_2^2 \mu_1 \\
& + \lambda_1 \lambda_2^2 \mu_2 + \lambda_1 \lambda_2 \mu_1^2 + 2 \lambda_1 \lambda_2 \mu_1 \mu_2 + \lambda_1 \lambda_2 \mu_2^2 + \lambda_1 \mu_1^2 \mu_2 + \lambda_1 \mu_1 \mu_2^2 \\
& + \lambda_2^2 \mu_1 \mu_2 + \lambda_2 \mu_1^2 \mu_2 + \lambda_2 \mu_1 \mu_2^2 + \mu_1^2 \mu_2^2) \tag{13}
\end{aligned}$$