$$\mathbf{A}\,\mathbf{\Gamma} = \boldsymbol{P}$$

$$\left(\begin{array}{cccc:cccc:c:cccc}
1 & 1 & \cdots & 1 & 0 & 0 & \cdots & 0 & \cdots\cdots\cdots & 0 & 0 & \cdots & 0 \\
0 & 0 & \cdots & 0 & 1 & 1 & \cdots & 1 & \cdots\cdots\cdots & 0 & 0 & \cdots & 0 \\
\vdots & \vdots & \cdots & \vdots & \vdots & \vdots & \cdots & \vdots & \vdots\ \vdots\ \cdots\ \vdots & \vdots & \vdots & \cdots & \vdots \\
0 & 0 & \cdots & 0 & 0 & 0 & \cdots & 0 & \cdots\cdots\cdots & 1 & 1 & \cdots & 1 \\
\hdashline
1 & 0 & \cdots & 0 & 1 & 0 & \cdots & 0 & \cdots\cdots\cdots & 1 & 0 & \cdots & 0 \\
0 & 1 & \cdots & 0 & 0 & 1 & \cdots & 0 & \cdots\cdots\cdots & 0 & 1 & \cdots & 0 \\
\vdots & \vdots & \cdots & \vdots & \vdots & \vdots & \cdots & \vdots & \vdots\ \vdots\ \cdots\ \vdots & \vdots & \vdots & \cdots & \vdots \\
0 & 0 & \cdots & 1 & 0 & 0 & \cdots & 1 & \cdots\cdots\cdots & 0 & 0 & \cdots & 1
\end{array}\right)
\left(\begin{array}{c}
\Gamma(x_1,\, y_1) \\
\Gamma(x_2,\, y_1) \\
\vdots \\
\Gamma(x_n,\, y_1) \\
\hdashline
\Gamma(x_1,\, y_2) \\
\Gamma(x_2,\, y_2) \\
\vdots \\
\Gamma(x_n,\, y_2) \\
\hdashline
\vdots \\
\vdots \\
\vdots \\
\vdots \\
\hdashline
\Gamma(x_1,\, y_m) \\
\Gamma(x_2,\, y_m) \\
\vdots \\
\Gamma(x_n,\, y_m)
\end{array}\right)
=
\left(\begin{array}{c}
q(y_1) \\
q(y_2) \\
\vdots \\
q(y_n) \\
\hdashline
p(x_1) \\
p(x_2) \\
\vdots \\
p(x_m)
\end{array}\right)$$