In[9]:= `Simplify[Dot[Inverse[IdentityMatrix[13] -`

$$\begin{pmatrix}
r & 0 & 0 & p/2 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & r & p/2 & 0 & 0 & 0 & 0 & 0 & p/2 & 0 & 0 & 0 & 0 \\
0 & p & r & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\
p/2 & 0 & 0 & r & 0 & 0 & 0 & p/2 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & r & p/2 & 0 & 0 & p/2 & 0 & 0 & 0 & 0 \\
0 & p/4 & 0 & 0 & p/4 & r & p/4 & 0 & 0 & p/4 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & p/2 & r & 0 & 0 & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & p/3 & 0 & 0 & 0 & r & p/3 & 0 & p/3 & 0 & 0 \\
0 & 0 & 0 & 0 & p/2 & 0 & 0 & p/2 & r & 0 & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & p/2 & 0 & 0 & 0 & r & 0 & 0 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & p/2 & 0 & 0 & r & p/2 & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & p & r & 0 \\
0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & r
\end{pmatrix}\,,$$

$$\begin{pmatrix}
p/2 & 0 & 0 \\
0 & 0 & 0 \\
0 & 0 & 0 \\
0 & 0 & 0 \\
0 & 0 & 0 \\
0 & 0 & 0 \\
0 & p/2 & 0 \\
0 & 0 & 0 \\
0 & 0 & 0 \\
0 & 0 & p/2 \\
0 & 0 & 0 \\
0 & 0 & 0 \\
0 & p/2 & p/2
\end{pmatrix}]]$$

`r :=`
`1 -`
`p`

Out[9]= $\left\{\left\{\dfrac{8}{9},\ \dfrac{1}{18},\ \dfrac{1}{18}\right\},\ \left\{\dfrac{5}{9},\ \dfrac{2}{9},\ \dfrac{2}{9}\right\},\ \left\{\dfrac{5}{9},\ \dfrac{2}{9},\ \dfrac{2}{9}\right\},\ \left\{\dfrac{7}{9},\ \dfrac{1}{9},\ \dfrac{1}{9}\right\},\ \left\{\dfrac{4}{9},\ \dfrac{5}{18},\ \dfrac{5}{18}\right\},\ \left\{\dfrac{1}{3},\ \dfrac{1}{3},\ \dfrac{1}{3}\right\},\right.$

$\left.\left\{\dfrac{1}{6},\ \dfrac{2}{3},\ \dfrac{1}{6}\right\},\ \left\{\dfrac{2}{3},\ \dfrac{1}{6},\ \dfrac{1}{6}\right\},\ \left\{\dfrac{5}{9},\ \dfrac{2}{9},\ \dfrac{2}{9}\right\},\ \left\{\dfrac{1}{6},\ \dfrac{1}{6},\ \dfrac{2}{3}\right\},\ \left\{\dfrac{2}{3},\ \dfrac{1}{6},\ \dfrac{1}{6}\right\},\ \left\{\dfrac{2}{3},\ \dfrac{1}{6},\ \dfrac{1}{6}\right\},\ \left\{0,\ \dfrac{1}{2},\ \dfrac{1}{2}\right\}\right\}$