

In the case $n = 7$, for what values of α will $\mathbf{A}$ be invertible?

$$\mathbf{A} \text{ invertible/regular} \Leftrightarrow \alpha \notin \left\{ \phantom{\frac{1}{2}, \frac{1}{3}, \frac{1}{4}, \frac{1}{5}, \frac{1}{6}, \frac{1}{7}} \right\}.$$