

$$A \rightarrow P^{-1}AP = D \quad A \text{ is diagonalizable}$$

$$P(P^{-1}AP)P^{-1} = PDP^{-1}$$

$$\frac{1}{\sqrt{3}} \cdot \frac{1}{\sqrt{2}}$$

$$|A| = |PDP^{-1}|$$

$$A = PDP^{-1} \quad A \text{ is factorable!}$$