## Solutions

**2.1**

- Subtract/eliminate: $x = 3$, $y = 2$.
- Check: $6 + 6 = 12$ and $3 - 2 = 1$.

**2.2**

- $(4 - \lambda)^2 - 1 = 0$: $\lambda = 5$ and 3.
- $(1, 1)$ for 5; $(1, -1)$ for 3.

**2.3**

- $\kappa \approx 40{,}000$ (nearest thousand).
- The rows are nearly parallel: a data nudge of $10^{-4}$ can move the answer by whole units - report the conditioning, not just the solution.

**2.4**

- $(2, 0) = 1 \cdot (1, 1) + 1 \cdot (1, -1)$ - equal shares.
- Each mode then oscillates at its own frequency; the split is the prediction.