

Concept Question 7-10: How can we get a useful solution to an underdetermined system of equations?

By computing the solution that minimizes a cost functional, such as $\sum|x[n]|$, $\sum x^2[n]$, or LASSO (Eq. (7.122)).

$$\Lambda = \frac{1}{2} \underbrace{\|\mathbf{y} - \mathbf{A}_w \mathbf{z}\|_2^2}_{\text{fidelity}} + \underbrace{\lambda \|\mathbf{z}\|_1}_{\text{sparsity}}, \quad (7.122)$$