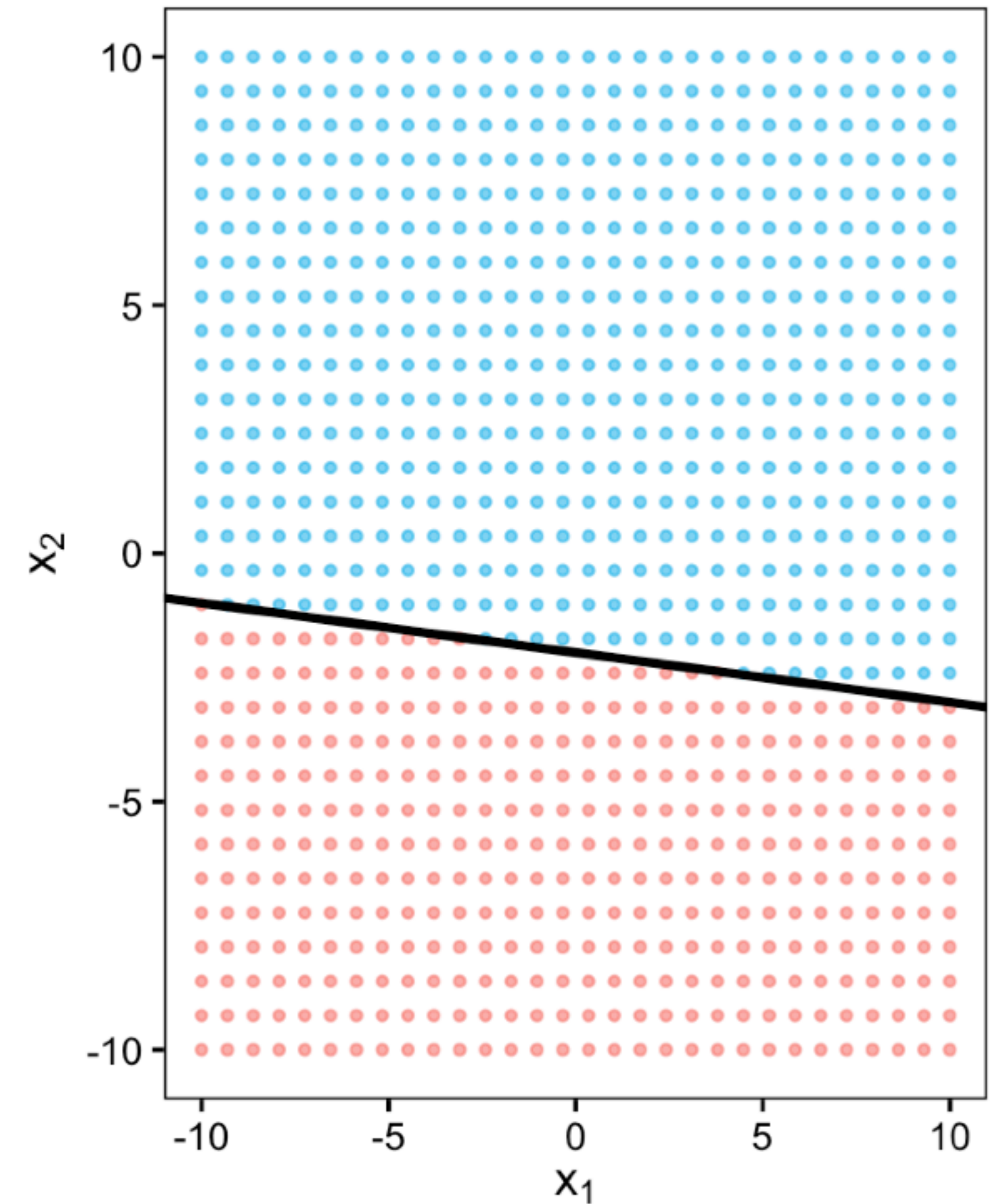
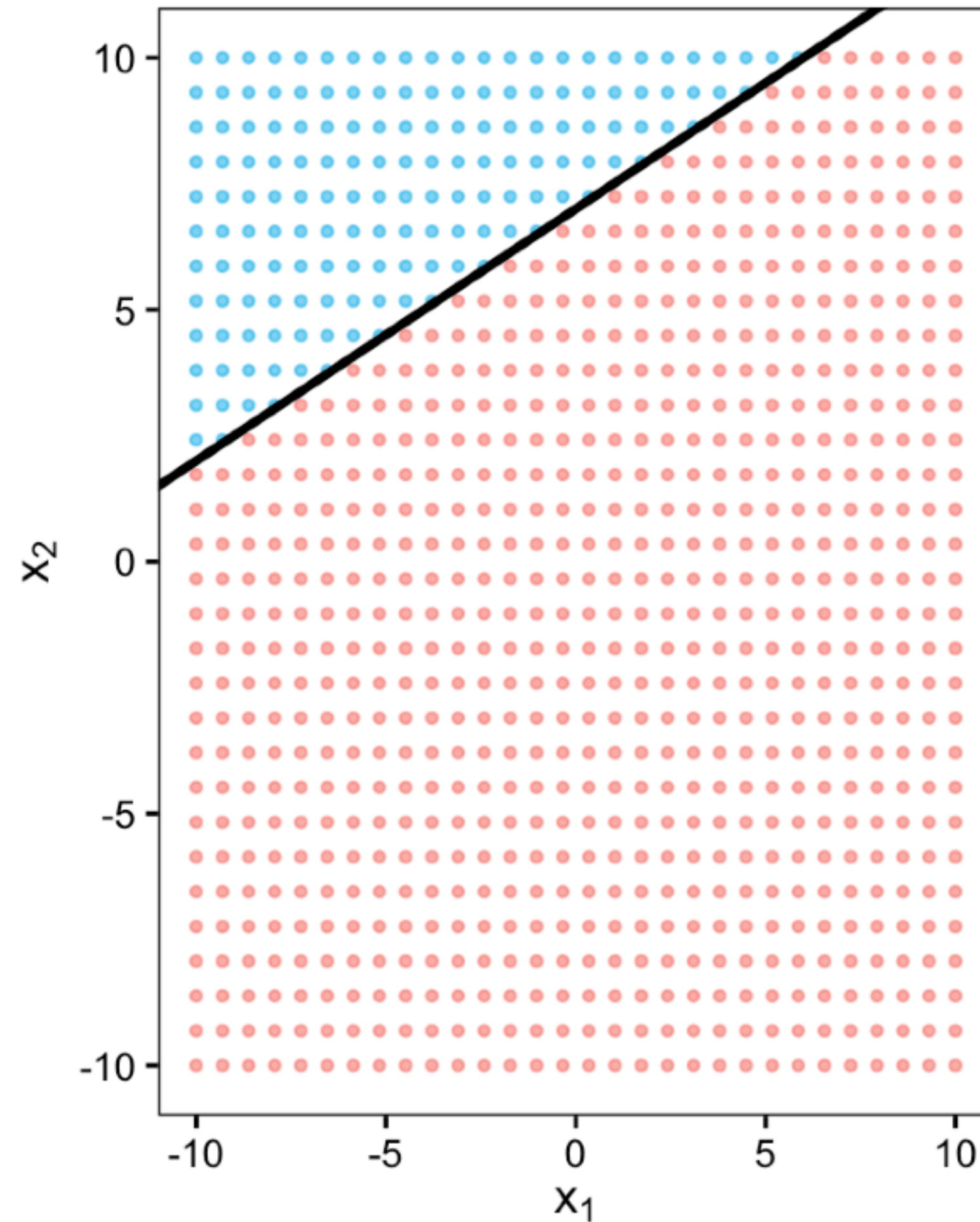
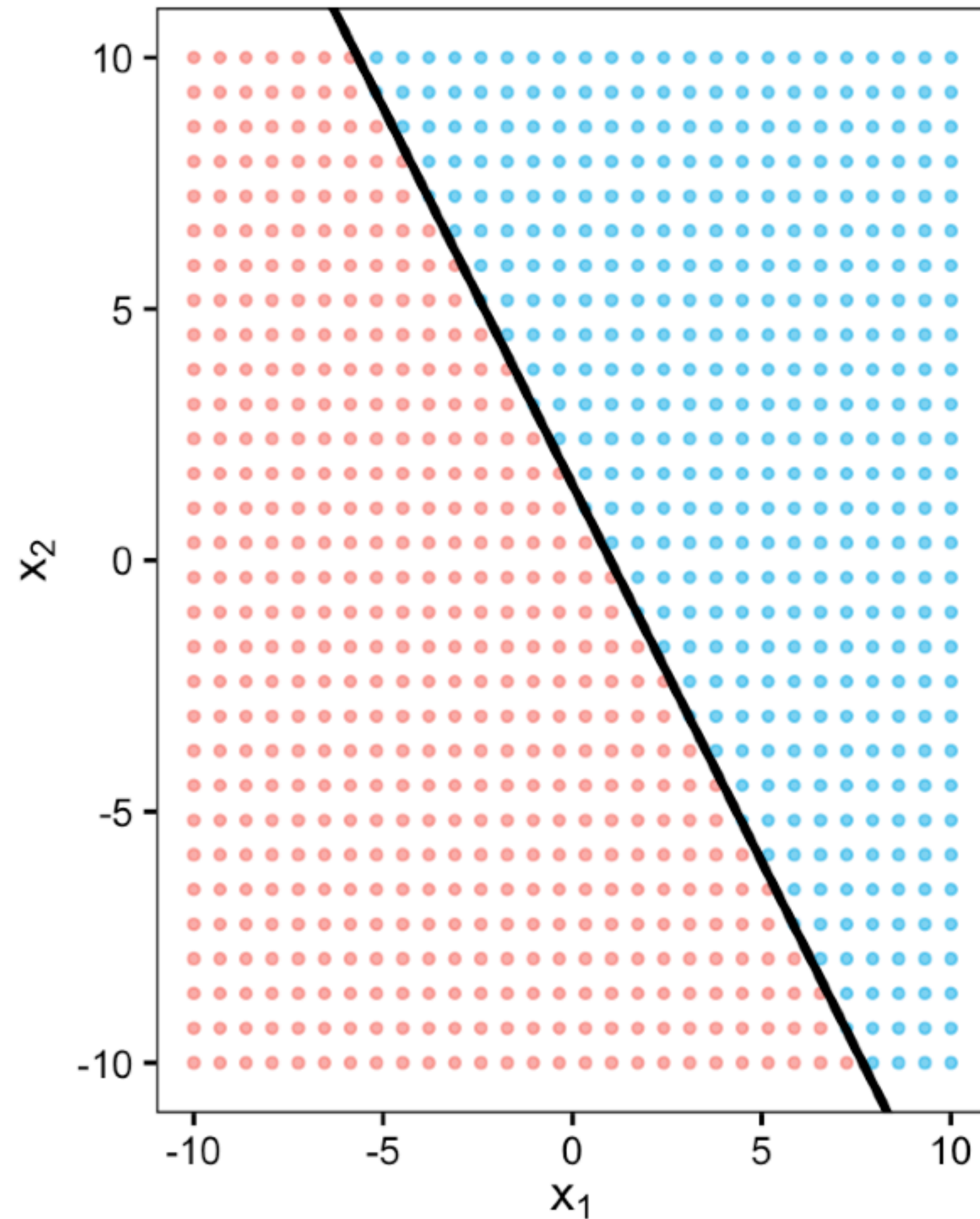
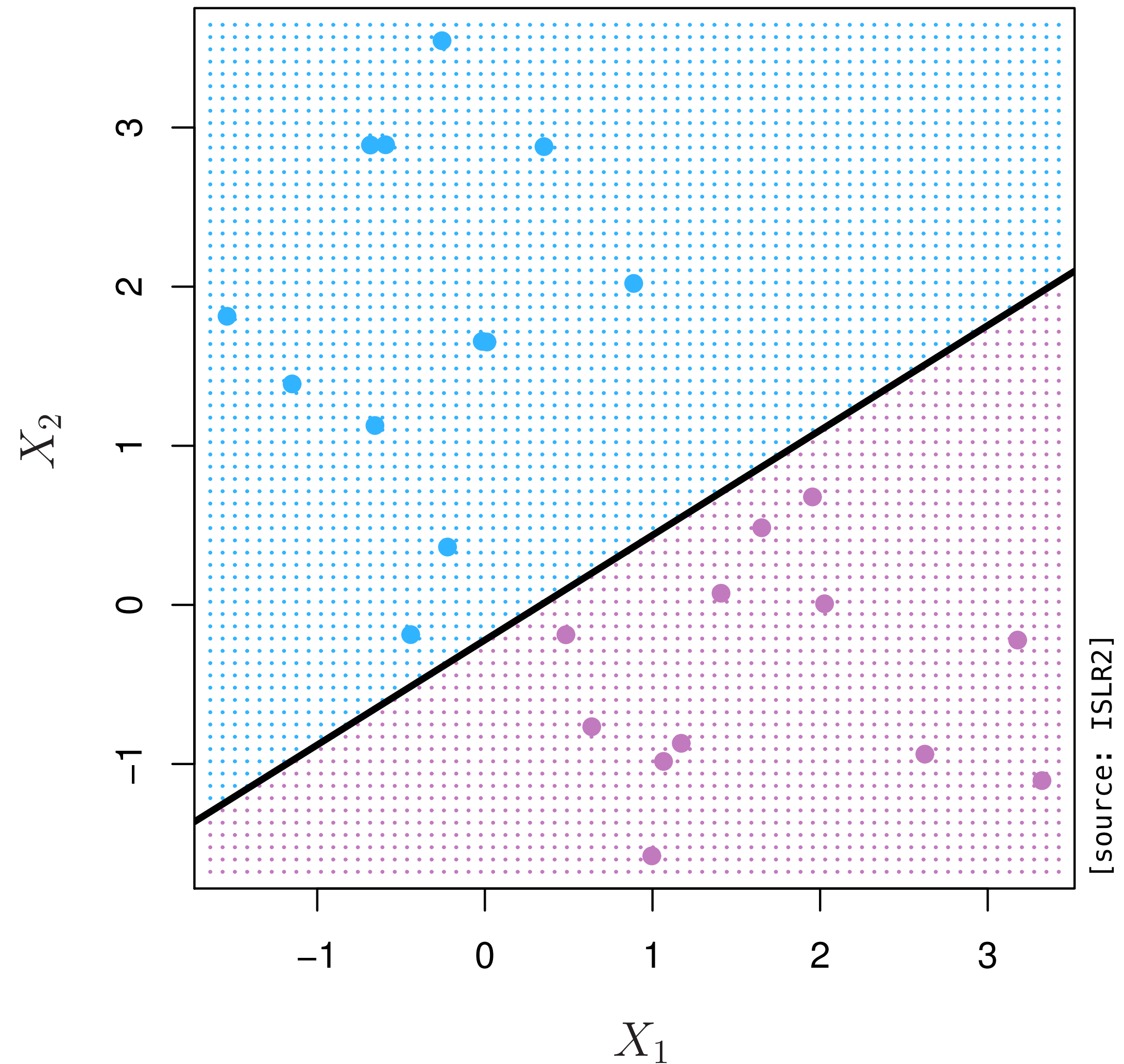
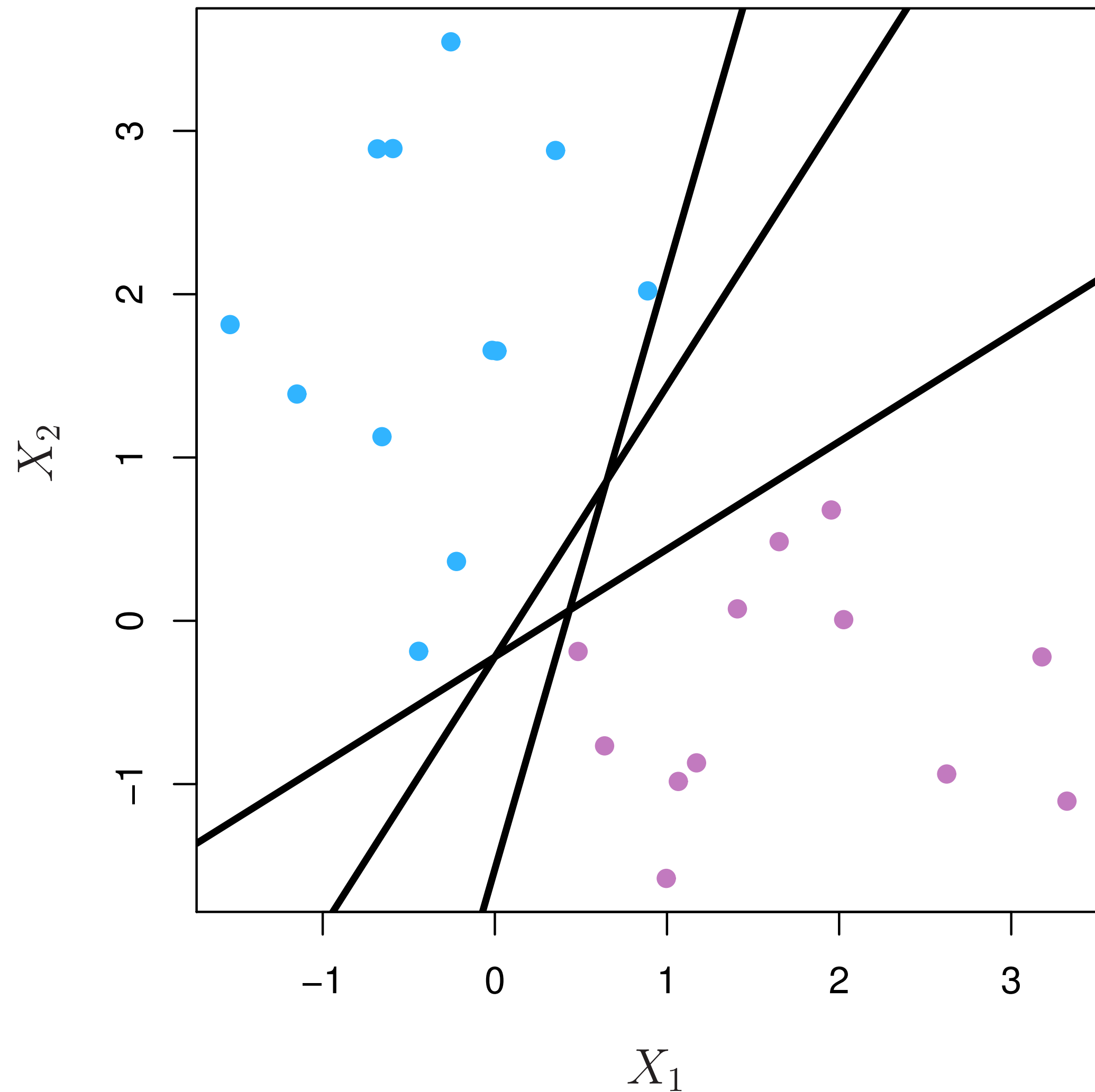


Hyperplanes Divide Spaces in Half



$$\begin{aligned} \beta_0 + \beta^T x &> 0 \text{ if } y_i = 1 \\ \beta_0 + \beta^T x &< 0 \text{ if } y_i = -1 \end{aligned} \implies y_i(\beta_0 + \beta^T x) > 0$$

Hyperplanes Divide Spaces in Half



[source: ISLR2]

if a separating hyperplane exists, there will be ∞ many of them
how do we choose just one?