ISLR 9.7.3

a)

no longer separable

optimal hyperplane

not the optimal separable hyperplane: $0.5 + X_1 + 0.8X_2 = 0$

Support vectors

margin
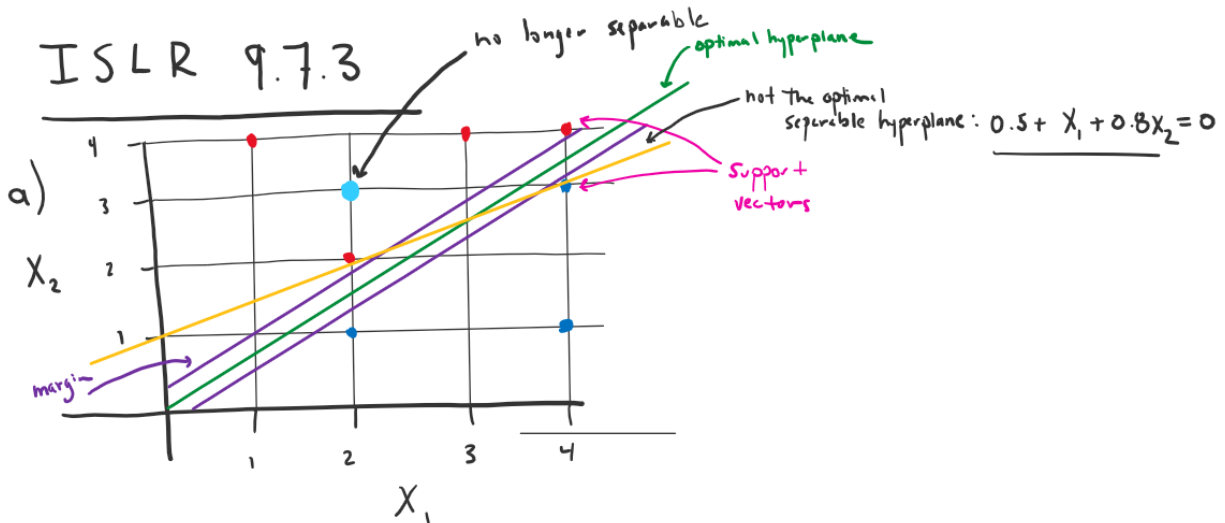
b) $\beta_0 + \beta_1 X_1 + \beta_2 X_2 = 0$

$-0.5 + X_1 + X_2 = 0$

c) Classify to red if $-0.5 + X_1 + X_2 > 0$, and classify to blue otherwise

f) Because $(4,1)$ is not a support vector, and is not determining the location of the hyperplane, altering its location will not affect the hyperplane.