Theoretical question on SVM (15%)

1. Minimizeθ 1/2 ||θ||2 subject to ytθTxt ≥ 1 for all t ∈ {1, ..., n}.
   1. Yes
   2. No, it also minimizes by θ0
   3. No, there is a soft margin but we don’t have a slack variable.
2. Minimize, 1/2 ||θ||2 subject to yt(θTxt + θ0)t ≥ 1 for all t ∈ {1, ..., n}.
   1. No, there is a better margin with the respect to θ0
   2. Yes
   3. No, there is a soft margin but we don’t have a slack variable.
3. 1. No, it would be better to have a bigger margin
   2. No, as in this case θ0 is 0, but in this picture, it is also optimized according to θ0
   3. Yes