

Let $\mathbf{W} = [w_0, w_1, w_2]^T = [-5, 2, 1]^T$, $X_1 = [2, 4]^T$, $X_2 = [3, 1]^T$, and $X_3 = [1, 1]^T$.

1. Plot the system (i.e., the hyperplane and all X_i).
2. Assume that W perfectly separates the data (i.e., labels each point correctly). What are the Y_i ?
3. What is the distance from each point to the hyperplane? What is the margin? Is this the maximum margin hyperplane?
4. If I select a new hyperplane $Q = 5W = [-25, 10, 5]^T$, what happens to the system? Plot the new system and find all the corresponding distances. What if I change the w_1 and w_2 components, but not w_0 ?





