



Course > Ch9 Support Vector Machines > 9.1 Optimal Separating Hyperplanes >  
9.1 Review Questions

## 9.1 Review Questions

### 9.1.R1

1/1 point (graded)

If  $\beta$  is not a unit vector but instead has length 2, then  $\sum_{j=1}^p \beta_j X_j$  is

☒ twice the signed Euclidean distance from the separating hyperplane  
 $\sum_{j=1}^p \beta_j X_j = 0$

☐ half the signed Euclidean distance from  $X$  to the separating hyperplane

☐ exactly the signed Euclidean distance from the separating hyperplane



Explanation

We know  $\beta' = \frac{1}{2}\beta$  has length 1, so it is a unit vector in the same direction as  $\beta$ . Therefore,  $\sum_{j=1}^p \beta_j X_j = 2 \sum_{j=1}^p \beta'_j X_j$ , where  $\sum_{j=1}^p \beta'_j X_j$  is the Euclidean distance.

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**i** Answers are displayed within the problem