1. 给定如下训练数据集，

***x***1=[3 3], ***x*** 2=[4 3], y1=1, y2=1

***x*** 3=[1 1],y3=-1

通过求解SVM的原始问题来求解最大间隔的分离超平面。

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通过求解SVM的对偶问题来求解最大间隔的分离超平面。

1. 推导软间隔SVM的对偶形式。
2. Show that, irrespective of the dimensionality of the data space, a data set consisting of just two data points (call them **x**(1) and **x**(2), one from each class) is sufficient to determine the maximum-margin hyperplane. Fully explain your answer, including giving an explicit formula for the solution to the hard margin SVM (i.e., **w**) as a function of **x**(1)and **x**(2).
3. Gaussian kernel takes the form:



Try to show that the Gaussian kernel can be expressed as the inner product of an infinite-dimensional feature vector.

Hint: Making use of the following expansion, and then expanding the middle factor as a power series.

