1) magnitude of $[.5, .5]$

$$\sqrt{.5^2 + .5^2} = .707$$

2) $\vec{x} \, \vec{w}^T = .5$

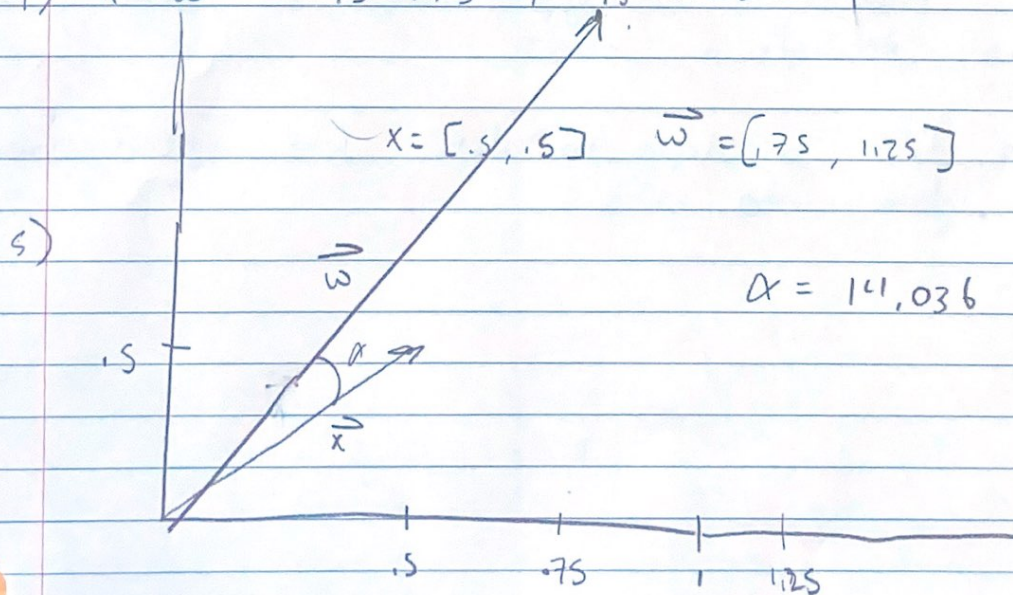|	.5	.5
.75	.375	.375
1.25	.625	.625

$$\begin{bmatrix} .375 & .375 \\ .625 & .625 \end{bmatrix}$$

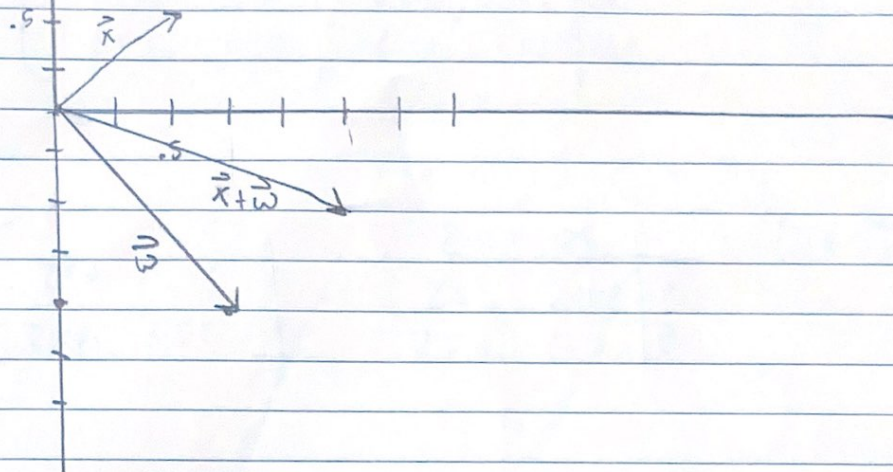3) $\vec{x}^T \times \vec{w}$

	.75	1.25
.5	.375	.625
.5	.375	.625

$$= \begin{bmatrix} .375 & .625 \\ .375 & .625 \end{bmatrix}$$

4) $\vec{x} \cdot \vec{w} = .5 \cdot .75 + .5 \cdot 1.25 = 1$

$x = [.5, .5]$ $\vec{w} = [.75, 1.25]$

5)

$\alpha = 14.036$

.5   .75   1.25

6)

Vectors labeled $\vec{x}$, $\vec{x}+\vec{w}$, and $\vec{w}$ drawn on axes with $.5$ marked.

7) Prediction: Predicts a continuous number or probability.
classification: Predicts a class

Prediction fits a shape to data while classification seperates data into classes