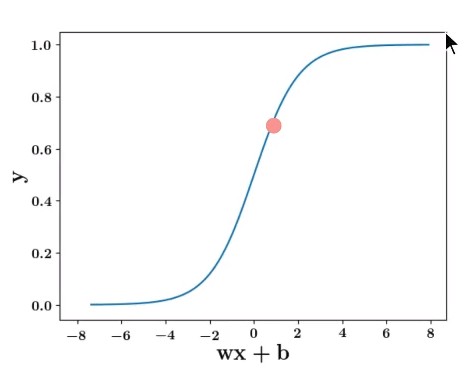
## **Using Cross Entropy With Sigmoid Neuron**

What does the cross entropy loss function look like

1. Consider an example in the scope of our final project
2. Look at the following signboard 
3. (True distribution, where 1 corresponds to Text)
4. This corresponds to =0.7 
5. Thus, the predicted distribution is (where 0.7 corresponds to Text)
6. The Loss function is where
7. (from probability axioms, y0 = 1 - y1)
8. Consider two examples side by side

|  |  |  |  |
| --- | --- | --- | --- |
| Training Data | Image |  | Loss function |
| y = [0, 1]  ŷ = 0.7  ỹ = [0.3, 0.7]  (Text) |  |  | When true output is 1 |
| y = [1, 0]  ŷ = 0.2  ỹ = [0.8, 0.2]  (No-Text) |  |  | When true output is 0 |

1. The Loss function can be expressed as follows
   1. if y = 1
   2. if y = 0
   3. Combining them and removing the if conditions:
      1. When y = 1, the first term becomes 0
      2. When y = 0, the second term becomes 0