CS691 Quiz 6 Name _____

1. We want to find the w that minimizes the following objective function $L(w)$. What values of w might gradient descent return? Explain. (3 points)

$$L(x) = x^3$$

2. Recall our regularized loss function. In this particular loss function, we have used an exponential loss $e^{y\hat{y}}$ with a $||w||^2$ regularizer. Find ∇L_w and $\frac{\delta L}{\delta b}$. (5 points)

$$L(w, b) = \sum_n e^{y_n(w \bullet x_n + b)} + \frac{\lambda}{2}||w||^2$$

3. If I am performing gradient descent on the following function: $L(w) = w^2$ starting with w=3. What would cause gradient descent to not reach the minimum and return $w = 0$? (2 points)

CS491 Quiz 6 Name _____

1. Run gradient descent on the function $f(x_1, x_2) = \frac{1}{2}x_1^2 + x_2^2$ starting at the point $s_0 = (2, 2)$ and using a step size of $\eta = \frac{1}{2}$. Run three steps of the algorithm. What is the output? (5 points)

2. Label each of the following loss functions using these options: 0/1, hinge, sigmoid, squared, absolute, exponential, log. (5 points)