Machine Learning Homework 8

Hairui Yin

1.

(a)

```python
import numpy as np
import matplotlib.pyplot as plt
from scipy.optimize import minimize_scalar

def f(x, P, q):
        return 0.5 * x.T @ p @ x + q.T @ x + \
                np.log(np.exp(-2 * x[0]) + np.exp(-x[1]))
def grad_f(x, P, q):
        grad_quadratic = P @ x + q
        exp_terms = np.array([np.exp(-2 * x[0]), np.exp(-x[1])])
        grad_logarithmic = -np.array([2 * exp_terms[0], exp_terms[1]]) / \
                np.sum(exp_terms)
        return grad_quadratic + grad_logarithmic
```