

Math 110A
Quiz 5
February 19, 2009

Name: _____

Section: _____

Total 40 points.

1. Consider the matrix $A = \begin{bmatrix} a & b \\ b & a \end{bmatrix}$

Consider the function $P(x) = \frac{1}{2}(x_1^2 + 2x_1x_2 + 2x_2^2) - x_1 + x_2$.

(a) (20 points) Find A and b to express $P(x)$ in the form $P(x) = \frac{1}{2}x^T Ax - x^T b$.

(b) (10 points) Use linear algebra to find the value of x for which P is minimized.

(c) (10 points) What is the minimum value of P ?

2. Extra Credit: What is the shape of P ?