Show all work. You may leave arithmetic expressions in any form that a calculator could evaluate. By putting your name on this paper, you agree to abide by the university's code of academic integrity in completing the quiz. Use no books, calculators, cellphones, other electronic devices, communication with others, scratchpaper, etc.

Name _____

1. (10) Fill in the 5 empty boxes with (exactly) one appropriate algorithm.
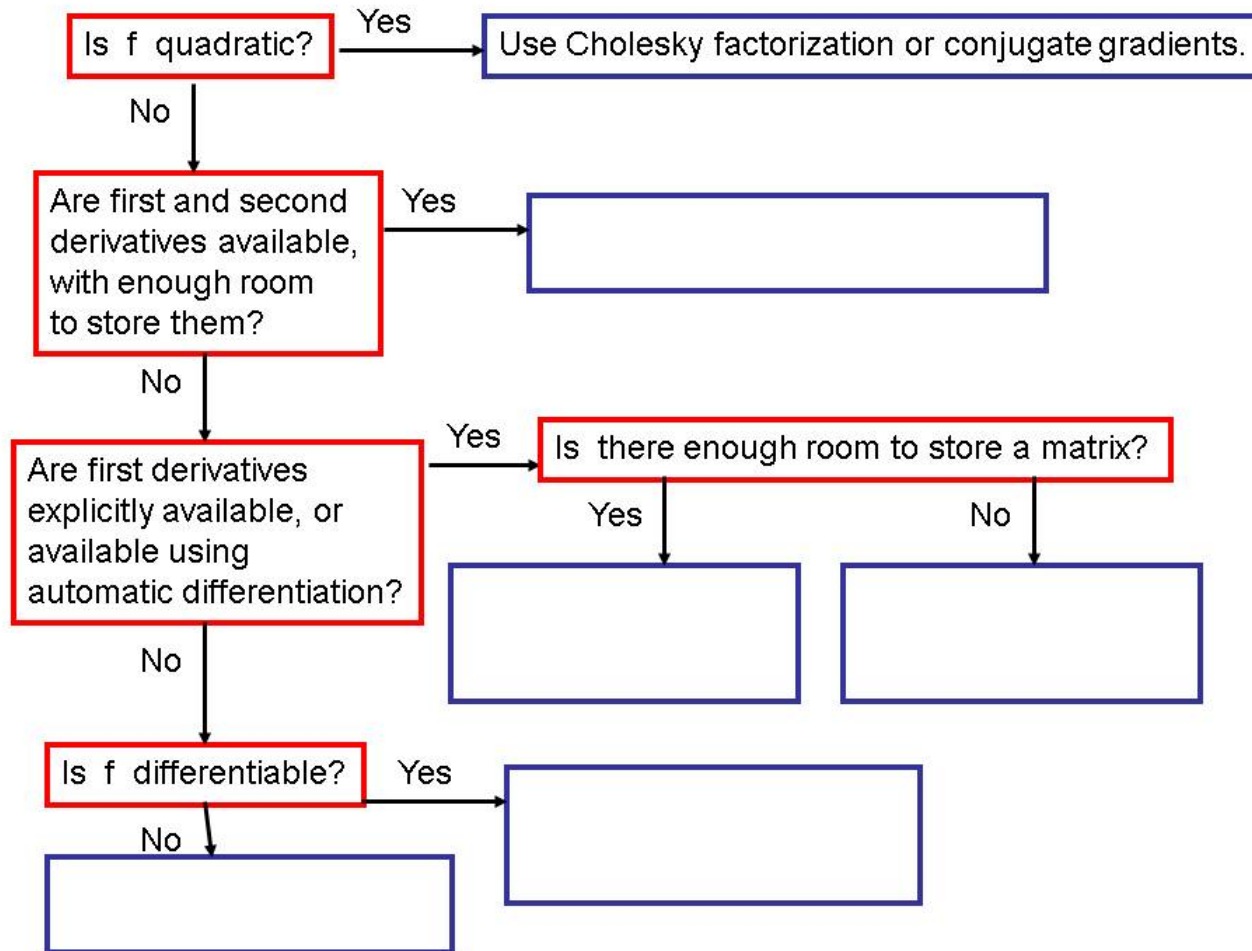
2. You want to solve the problem

$$\min_{\boldsymbol{x}}(x_1 - 2)^2 - (x_2 - 5)^2.$$

Your assistant tells you that the solution is $x_1 = 2$, $x_2 = 5$.

2a. (5) Check the first- and second-order optimality conditions at $x_1 = 2$, $x_2 = 5$.

2b. (5) Is the point a local minimizer? Explain why or why not.