Fall 2017 **Quiz 5** Math 0220

20 minutes **Name:** _____

No calculators, no notes, no books. Show all your work (no work = no credit). Write neatly.

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1. (5 points)   Find the absolute maximum and absolute minimum values of the function

   $f(t) = 2\sqrt{x} - x$ when $0 \le x \le 9$.   Justify your answer.

2. For the function $f(x) = x^3 - 3x + 1$

    (a) (4 points) Find intervals on which f is increasing or decreasing.

    (b) (3 points) Find local maximum and local minimum values of f.

    (c) (3 points) Find intervals of concavity, types of concavity, and inflection points.

bonus problem (5 points extra)   Suppose that $f(1) = -1$ and $f'(x) \leq 2$ for all x.
How large can $f(4)$ possibly be?