QUIZ 6

Instructions: Complete the following problems. You may use the derivative shortcuts developed in class to answer these problems, though you are encouraged to show as much work as possible so that partial credit may be awarded.

(1) (30 pts) Find the absolute maximum of the function $f(x) = 2\ln(x) - x^2$ on $(0, \infty)$. Be sure to justify why your answer is a maximum.

(2) (30 pts) Find the absolute extrema (maxima and minima) of the function $f(x) = 2x^3 + 3x^2 - 12x + 1$ on the interval $[0, 2]$.

(3) (40 pts) Old MacDonald had a farm, and on that farm he had an old stone wall running along the western edge of his fields. He also has 1200 feet of fencing that he'd like to use to make a rectangular pen for his pigs. Cleverly, he decides that he'll use that old stone wall for one side of the pen, so that he'll use his fencing for the other three sides. What is the maximum area that Old MacDonald's pigpen can have?