Math 16010 — Optimization and Antiderivatives Practice Quiz
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You will have 15 minutes to complete this quiz. Show all relevant work and respond to questions in full sentences to receive full credit. No work shown is worth no credit.

1 (3 points)

If I plant x grams of carrot seeds in my garden plot, I will produce $q = 8\sqrt{x}$ pounds of carrots in a year. Carrot seeds cost \$10/gram. I will eat 6 pounds of carrots this year, and any carrots I don't grow myself I will have to buy at the store for \$2.30/pound.

(a) (1/2 point) Write a formula for the amount of money I spend on carrot seeds, in terms of x.

(b) (1/2 point) Write a formula for the amount of money I spend on carrots from the store, in terms of q.

(c) Write a formula for the total amount of money I spend on carrots and carrot seeds in a year, in terms of x and q.

(d) Use a constraint to rewrite your formula from part (c) to depend only on x.

DO NOT go on to optimize the formula. Just writing it is enough.

2 (3 points)

$f''(x) = 1/x^2$, $f'(2) = 2$, and $f(1) = 6$. Find a formula for $f(x)$.

3 (4 points)

What is a topic on exam 3 which you feel you have mastered, and how can you tell? What is a topic on exam 3 which you feel you might need to study more, and why? Respond in at least five full sentences to receive full credit.