HOMEWORK 7

Due on: November 4 at 3:00pm (submit via Crowdmark).

Notice what you are required to find in each question.

Question 1. The price and demand for a certain item are related via the equation

$$10p\sqrt{q} + 100 + pq = 5000$$

- (a) Find the elasticity when p = 10 and q = 300. Should you increase or decrease the price in order to increase the revenue?
- (b) Use your answer to (a) in order to estimate the relative change in the demand if the price is raised by 3%.

Question 2. Find the absolute (a.k.a. global) extremal values of the function $f(x) = \sqrt{4-x} + 2\sqrt{x}$ on the interval [0, 4].

Question 3. Find the largest and smallest values that the function $f(x) = x^3 e^x$ attains on the interval [-10, 1].

Question 4. Find the point with the largest y coordinate on the ellipse

$$x^2 + xy + 2y^2 = 4$$

[Hint: Use implicit differentiation. What is $\frac{dy}{dx}$ when the y coordinate is maximal?]