Name: _____

Directions: Show all work. No credit for answers without work.

1. [**5 points**] When the price of a movie ticket is $7, a local theater sells 200 tickets. For every $0.50 increase in price, the theater sells 9 fewer seats. Find the price that maximizes revenue.

2. [**5 points**] At time t, a car travels at a speed of $30 + 10\sqrt{t}$ miles per hour. In this problem, we estimate the total distance the car travels between time $t = 0$ hours and time $t = 4$ hours.

(a) Underestimate   (b) Overestimate
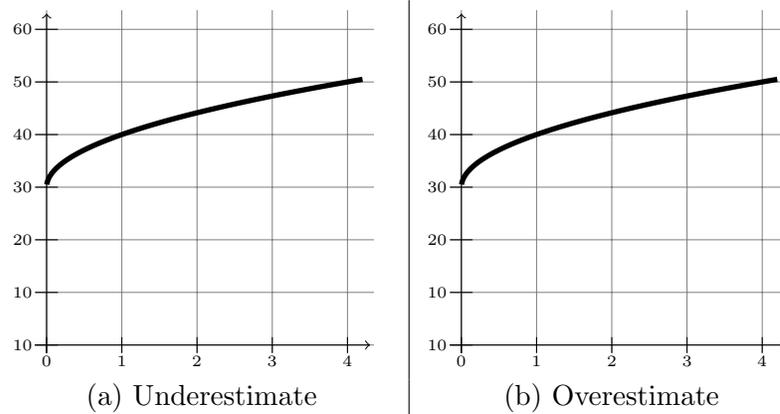
(a) Using 4 rectangles, give an underestimate for the total distance traveled. Illustrate your underestimate above in Figure (a).

(b) Using 4 rectangles, give an overestimate for the total distance traveled. Illustrate your overestimate above in Figure (b).

(c) Average the two estimates together to obtain an approximation to the total distance traveled. Is this average an overestimate or an underestimate for the true distance traveled?