Rates of Change: Velocity and Marginals

1. Find the marginal cost for producing x units. (The cost is measured in dollars). (similar to p.114 #22)

$$C = 200\left(3x + 4\sqrt{x}\right)$$

2. Find the marginal revenue for producing x units. (The revenue is measured in dollars). (similar to p.114 #26)

$$R = 60(30x - x^{5/2})$$

3. Find the marginal profit for producing x units. (The profit is measured in dollars). (similar to p.115 #30)

$$P = -0.2x^3 + 40x^2 - 132.1x - 500$$

4. The revenue R (in dollars) from renting x apartments can be modeled by
$R = 3x(800 + 40x - x^2)$
(a) Find the additional revenue when the number of rentals is increased from 10 to 11 (algebra method).
(b) Find the marginal revenue when x = 10 (calculus method)
(c) Compare the results of parts (a) and (b)

(similar to p.115 #32)

5. Profit. The monthly demand function and cost function for x newspapers are given by p = 4 - 0.002x and C = 40 + 2.3x
(a) Find the monthly revenue R as a function of x (R = xp)
(b) Find the monthly profit P as a function of x (P = R - C)
(c) Complete the table below
(similar to p.115 #38)

X	300	600	900	1200	1500
dR/dx					
dP/dx					
P					

6. Marginal Profit. When the admission price was \$5 per ticket, 40000 tickets were sold. When the price was raised to \$6, only 30000 tickets were sold. Assume that the demand function is linear and that the variable and fixed costs are \$0.15 and \$90000, respectively.

(a) Find the profit P as a function of x, the number of tickets sold

(b) Find the marginal profits when 10000 tickets are sold and when 30000 tickets are sold

(similar to p.116 #40)