

## Section 4.2 Marginals, marginal cost, revenue, profit.

-  $C'(6)$  = cost of 7<sup>th</sup> item

HW Example Pg 310 #12

Part a:  $C(x) = 350 + 0.10x + 0.002x^2$  dollars }  
 $R(x) = 1.10x$  } Actuals  
 $R - C = P$   
 $R = \text{revenue}, C = \text{cost}, P = \text{profit}$   
 $P(x) = (350 + 0.10x + 0.002x^2) + 1.10x$   
or  
 $P(x) = -0.002x^2 + x - 350$

marginals { a) marginal revenue = Find 1<sup>st</sup> derivative  
 $R'(x) = 1.10$  will always receive this  
an . . . |  
marginal cost =  $C'(x) = 0.10 + 0.004x$   
marginal profit =  $P'(x) = -0.004x + 1$

Part b: **Step 1**  $x = 200$

$$R(x) = R(200) = 1.10(200) = 220$$

$$P(200) = -0.002(200)^2 + 200 - 350 = -230$$

losing money

$$R'(200) = 1.10$$

$$P'(200) = -0.004(200) + 1 = 0.20 \text{ profit increases @ each serving (addl.)}$$

Part c:  $P'(x) = 0$  ;  $0 = -0.004x + 1$

$$\frac{-1}{-0.004} = \frac{-0.004x}{-0.004}$$

**$x = 250$**   
break-even point  
need to sell 250 servings