

Quiz 5

Name Key

Recitation (Circle) 1:30P 2:30P
 3:30P 4:30P

Use the techniques learned in class to do the following problems and show your work!!!

Problem 1: (6 points)

The two equations below are a demand equation and a supply equation, respectively. Determine the Producer's Surplus.

Eq pt:

$$25 - q^2 = 1 + 10q$$

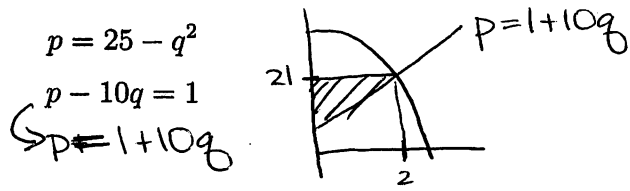
$$0 = q^2 + 10q - 24$$

$$0 = (q+12)(q-2)$$

$$q = -12, q = 2$$

$$\rightarrow p = 1 + 10(2)$$

$$p = 21$$



$$PS = \int_0^2 21 - (1 + 10q) dq$$

$$= \int_0^2 20 - 10q dq = [20q - 5q^2]_0^2$$

$$= [20(2) - 5(2)^2] - [0 - 0] = 40 - 20 = \boxed{\$20}$$

Problem 2: (4 points) Let $f(t) = 10 - t$, $m = 10$, $s = 1$, $R = 5$

Find the total revenue, where the formula is:

$$Total\ Revenue = \int_0^R (m + st)f(t) dt$$

$$= \int_0^5 (10 + t)(10 - t) dt = \int_0^5 100 - t^2 dt$$

$$= [100t - \frac{t^3}{3}]_0^5 = 500 - \frac{5^3}{3} = \boxed{\$458.33}$$