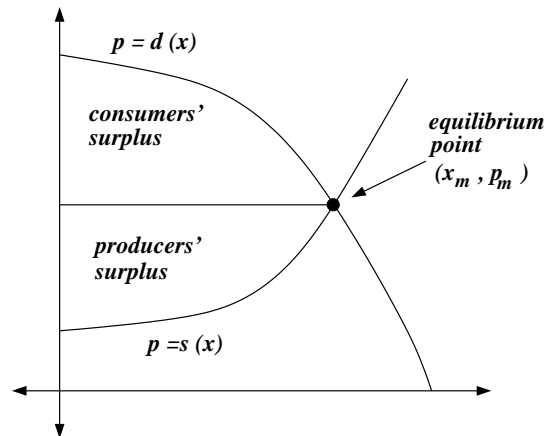


Math142 Lecture Notes

7.2 - Applications in Business and Economics



Consumers' Surplus

If $p = d(x)$ is a demand equation and (x_m, p_m) is the equilibrium point, then the consumers' surplus is given by

$$\int_0^{x_m} [d(x) - p_m] dx$$

Producers' Surplus

If $p = s(x)$ is a supply equation and (x_m, p_m) is the equilibrium point, then the producers' surplus is given by

$$\int_0^{x_m} [p_m - s(x)] dx$$

Example 1: If $d(x) = 330 - \frac{1}{5}x$ represents a demand equation and $x_m = 200$ represents the number of units demanded, find the consumers' surplus.

Example 2: If $s(x) = 0.27x + 60$ represents a supply equation and $x_m = 80$ represents the number of units supplied, find the producers' surplus.

Example 3: Build-It, a local home improvement store, has determined that the demand function for a 30-gallon trash can is given by

$$d(x) = 13 - 0.01x^2$$

while the related producer supply function is given by

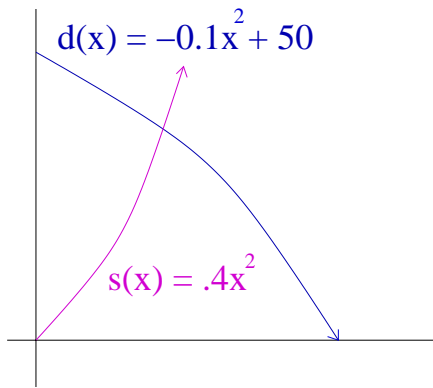
$$s(x) = 0.1x + 1$$

where x is the daily quantity and $d(x)$ and $s(x)$ are in dollars per can.

(a) Determine the equilibrium point.

(b) Determine the consumers' surplus at the equilibrium point.

(c) Determine the producers' surplus at the equilibrium point.



Example 4: Shade the region that represents the consumers' surplus. Write an integral to determine the consumers' surplus.

For the supply and demand functions shown above, find the producers surplus.

What is the equilibrium point?