

Prob. Set 7

Problem 2.3 p105

Answer

Monopolist sets $p = \bar{s} - t$ in order to sell to the whole market.

If he sets up two shops $p = \bar{s} - \frac{t}{2}$. The increase in profit

$$\Delta \pi^M = (\bar{s} - \frac{t}{2}) - (\bar{s} - t) - F \quad \text{where } F = 2t - t = t - f > 0, \text{ so monopolist sets up 2 shops.}$$

The planner maximizes welfare from consumption regardless of sites, but transportation costs are part of social costs so:

$$\Delta w = \int_0^1 (t+x) dx - 2 \int_0^{\frac{1}{2}} (t+x) dx - f$$

$$= t \left\{ \frac{1}{2} x^2 \Big|_0^1 - 2 \frac{1}{2} x^2 \Big|_0^{\frac{1}{2}} \right\} - f = \frac{t}{2} \left(1 - \frac{2}{4} \right) - f$$

$$= \frac{t}{4} - f < 0. \text{ So he sets up 1 shop.}$$