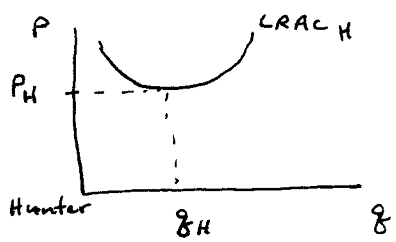
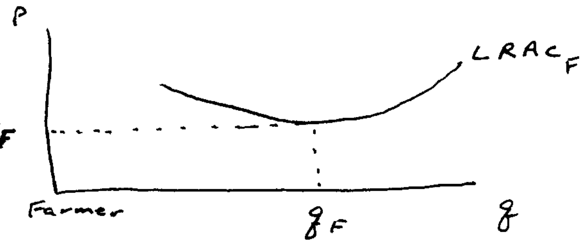
ECO 601-001 Problem Set #10 KEY Fall 2004

1. If no tariff is imposed, then lower-cost shrimp "farmers" will survive and higher-cost shrimp "hunters" will not:



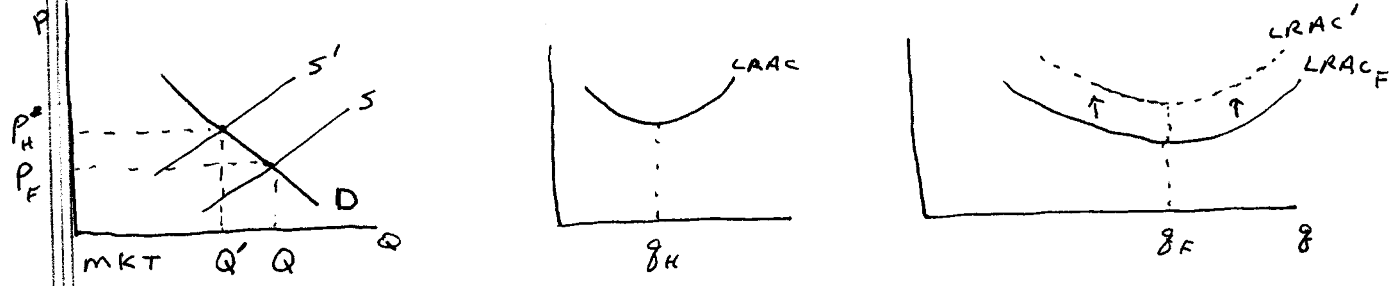


Shrimp hunters have higher ATC and smaller MES.

Shrimp farmers have lower ATC and larger MES.

Long-run equilibrium will occur with market price equal to P_F and only those shrimpers whose costs are that low surviving in the market.

If a tariff is imposed that raises imported shrimp costs up to P_H, then the market output will be produced by a mix of high-cost domestic shrimp hunters and low-cost-plus-tariff imported shrimp farmers. Market price will rise to P_H and market quantity demanded will decline:



no tariff: $P = P_F \quad Q = \sum^{n} q_F$

tariff: $P = P_H \quad Q' = \sum^{\ell} q_H + \sum^{m} q_F, \quad m < n$

2.

$C(Q) = 100 + Q^2$, $MC = \frac{dC}{dQ} = 2Q$

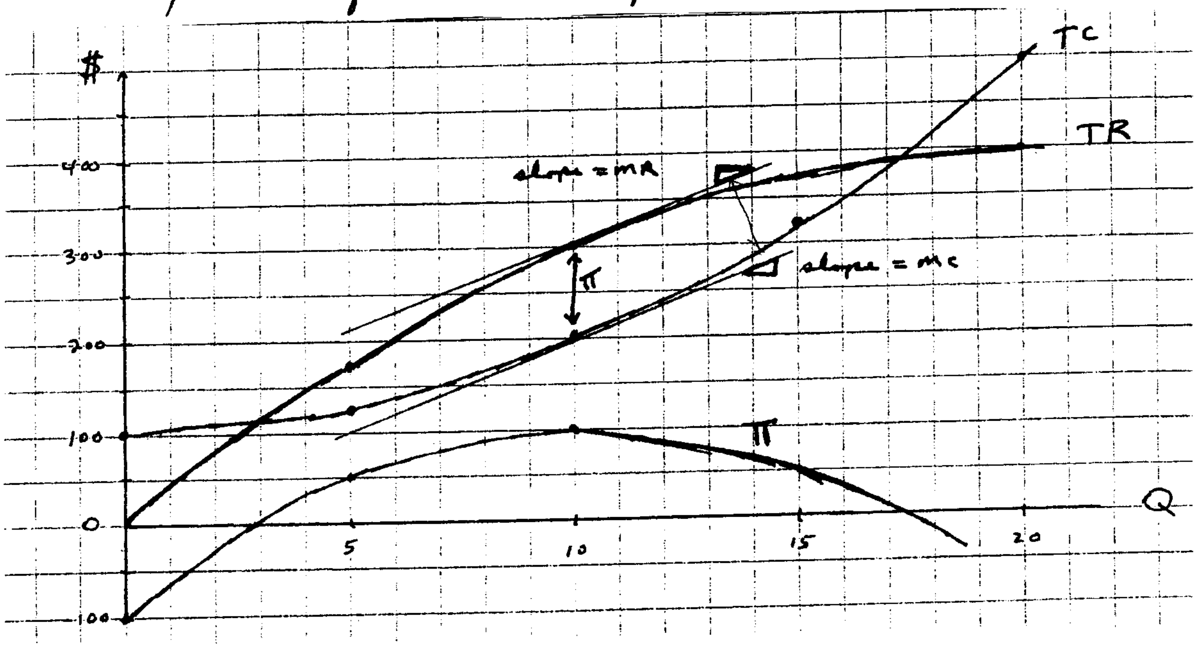
$P(Q) = 40 - Q$, $TR = 40Q - Q^2$, $MR = 40 - 2Q$

(a) $MR = MC \Rightarrow 40 - 2Q = 2Q$, $Q = 10$

$P = 40 - Q = \$30$

$\pi = TR - TC = 40Q - Q^2 - 100 - Q^2 = \$100$

(b) see diagram. The MR = MC necessary condition for maximum profit is illustrated by the slopes of the TR and TC functions. They are equal where profits are maximized.



3. 13.8 a. For perfect competition, $MC = \$10$. For monopoly $MC = \$12$.

$Q_D = 1000 - 50P$. The competitive solution is $P = MC = \$10$. Thus $Q = 500$.

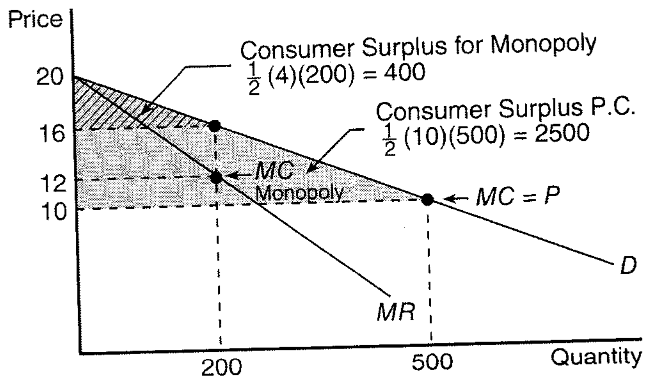
Monopoly: $P = 20 - \frac{1}{50}Q$, $PQ = 20Q - \frac{1}{50}Q^2$

Produce where $MR = MC$. $MR = 20 - \frac{1}{25}Q = 12$. $Q = 200$, $P = \$16$

b. See graph below.

Loss of consumer surplus = Competitive CS – monopoly CS =

$2500 - 400 = 2100$.



c.

Of this 2100 loss, 800 is a transfer into monopoly profit, 400 is a loss from increased costs under monopoly, and 900 is a "pure" deadweight loss.

4. $L = 50w \Rightarrow w = \frac{L}{50}$

$MP_L = 2$ tons / hr ; $P_{coal} = \$10$ / ton

$VMP_L = \$20$ per worker hour

monopsony: total labor cost $= w(L) \cdot L = \frac{L^2}{50}$

$MFC_L = \frac{d(TLC)}{dL} = \frac{L}{25}$

$VMP_L = MFC_L \Rightarrow \frac{L}{25} = 20 \Rightarrow L = 500$ workers

$w = \frac{L}{50} = \$10$ per hour for π max

competition: $VMP_L = w$, so $w = \$20$

$L = 50w$, so $L = 1000$ under competition

5. 16.5 a. Grant = 6000 – .75(I)

If $I = 0$ Grant = 6000

$I = 2000$ Grant = 4500

$I = 4000$ Grant = 3000.

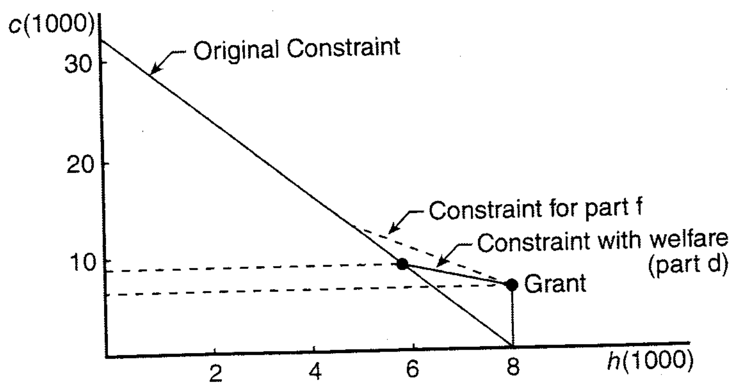
b. Grant = 0 when $6000 - .75I = 0$

$I = 6000/.75 = 8000$

c. Assume there are 8000 hours in the year.

Full Income = 4 • 8000 = 32,000 = $c + 4h$.

d. Full Income = 32,000 + grant = $32{,}000 + 6000 - .75 \cdot 4(8000 - h) = 38{,}000 - 24{,}000 + 3h = c + 4h$ or $14{,}000 = c + h$ for I – – 8,000. That is: for $h >$ 6,000 hours welfare grant creates a kink at 6,000 hours of leisure.



e.

f. New budget constraint is $23{,}000 = c + 2h$ for $h > 5{,}000$.

g. Income and substitution effects of law change work in opposite directions (see graph). Substitution effect favors more work; income effect, less work.

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