THE PENNSYLVANIA STATE UNIVERSITY
Department of Economics

Economics 428 — Gallant

Sample Midterm Answers — Spring 2021

1. c

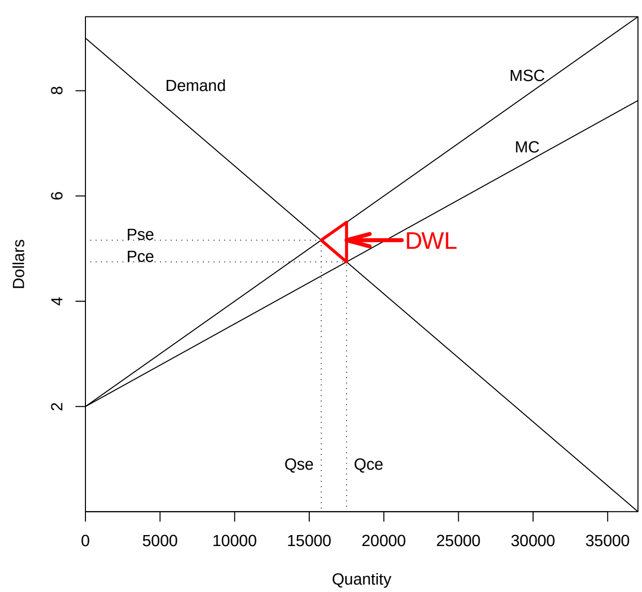
2. b

3. a

4. (a) $P = MC$ implies $Q = 17,500$ and $P = 4.75$.

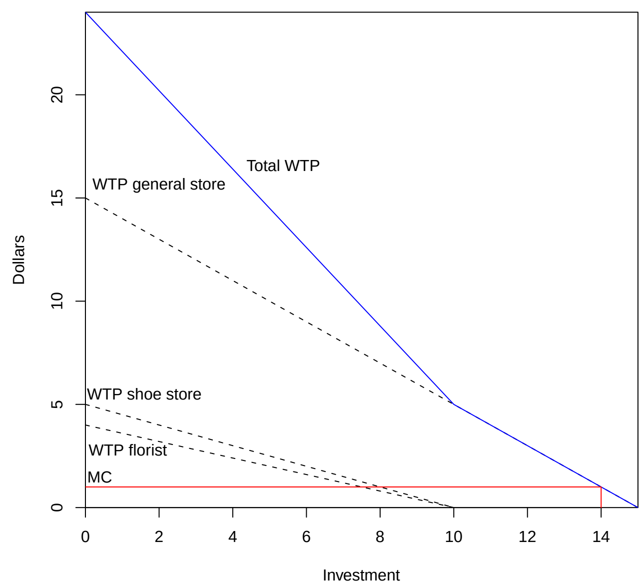
   (b) $P = MC + MEC$ implies $Q = 15,801$ and $P = 5.16$.

   (c) Price increases and quantity decreases. Market efficiency is increased. Graphically, efficiency is increased by the amount of the "deadweight loss triangle" that is above the demand curve between the private MC curve and social MC curve.



5. (a) For investment levels greater than 10, social marginal benefit is equal to the marginal benefit of the general store.

   (b) $I = 14$



(c) $I = 14$: With a dominant beneficiary and low marginal cost, you get efficient provision of the public good.

6. If $P_1 = 13$ and $P_2 = 10$ for the example considered in class to illustrate Coase's Theorem, the following table results.

$P_1 = 13,\ P_2 = 10$	Q_1	Q_2	Profit 1	Profit 2	Total
Optimal (merge firms)	5.33	2.33			34.33
No Property Rights	6.5	0	34.25	0	34.25
Firm 1 Shut Down	0	5	0	21	21
Property Rights					
Polluter Pays	5.33	2.33	13.33	21	34.33
Victim Pays	5.33	2.33	34.25	0.08	34.33

(a) Fill in the cells marked with question marks.

(b) What is the dead weight loss due to the externality? 34.33-34.25=0.08

7. (a)

	Surplus, Pg=45, Pc=40	
Consumer Type	Green	Conventional
Environmentally Sensitive	65-45=20	55-40=15
Regular	45-45=0	40-40=0

Sensitive buys green. Regular buys conventional. Regular has zero surplus either way but has \$5 to spend on something else if buys conventional.

(b)

	Surplus, Pg=50, Pc=40	
Consumer Type	Green	Conventional
Environmentally Sensitive	65-50=15	55-40=15
Regular	45-50=-5	40-40=0

Both sensitive and regular buy conventional. Sensitive has zero surplus either way but has \$10 to spend on something else if buys conventional.

8. Merge the firms: $\Pi(Q_1, Q_2) = P_1Q_1 + P_2Q_2 - C_1(Q_1) - C_2(Q_1, Q_2)$.

   Each product price must equal marginal cost:

   $P_1 = 2Q_1 + Q_2$

   $P_2 = 2Q_2 + Q_1$

   Solve:

   Rewrite first equation: $Q_2 = P_1 - 2Q_1$

   Substitute in second equation: $P_2 = 2(P_1 - 2Q_1) + Q_1 = 2P_1 - 3Q_1$

   Rearrange terms: $Q_1 = \frac{1}{3}(2P_1 - P_2)$

   Rewrite second equation: $Q_1 = P_2 - 2Q_2$

   Substitute in first equation: $P_1 = 2(P_2 - 2Q_2) + Q_2 = 2P_2 - 3Q_2$

   Rearrange terms: $Q_2 = \frac{1}{3}(2P_2 - P_1)$.

   If $P_1 = 13$ and $P_2 = 11$, then $Q_1 = \frac{15}{3} = 5$ and $Q_2 = \frac{9}{3} = 3$.