You **MUST SHOW YOUR WORK** clearly either in the margins or on an attached sheet of paper for complete credit.

**CAUTION:** Be careful of the sign of the intercept on the Supply curves.

A. Review (6 pts) The market for apples is: P: 3 5 7 9 11 etc., \( A=2.4+4.6 = 9 \) \( A=2.6+3.5 \) Qd: 40 36 32 28 24 etc., \( Qd = 4.6 - 2P \) \( Qs = -6 + 3P \) Qs: 15 21 27 33 39 etc.,

1. \( \frac{P}{C} = \frac{8}{2} = 4 \) \( \frac{Qd}{Qs} = 30 \) What is equilibrium P and Q?

2. \( 225 + 144 = 369 \) What are the total gains from trade?

B. Market Failure (11 pts) Suppose there is an uncounted cost from the production of apples (pesticides cause damage to wildlife) so that the TRUE cost to society of producing apples is \( Qs = -9 + 3P \).

1. \( \frac{1}{24} \) \( 18 = \left( \frac{3+13}{2} \right) 30 = 210 \) At the equilibrium above (Answer to A#2) what is the TRUE cost?

2. \( 1 - \frac{1}{2} = 24 \) \( -2 = -24 \) \( \frac{P}{C} = 32 \) At the equilibrium above, what is the TRUE producer surplus?

3. \( \frac{C}{P} = 15 \) \( \frac{P}{C} = 6 \) \( \frac{P}{Q} = 6 + 13P \) At the equilibrium above, what is the dead weight loss?

4. \( \frac{P}{Q} = 6 + 13P \) \( \frac{P}{Q} = 6 + 13P \) Suggest one policy that will eliminate this dead weight loss. (many correct answers)

C. Market Power (33 pts) The market for widgets is P: 20 40 60 etc., Qd: 6 \( -^2 \) 4 \( -^2 \) 2 etc., Qs: 3 \( =_{2} \) 4 7 \( ^=_{2} \) 11 etc.,

1. \( Qd = 8 - \frac{1}{6}P \) What is the equation for the demand curve (Qd=f(P))? \( 6 = -\frac{1}{6}P = -1 + \frac{1}{6}P \) \( 9 = \frac{3}{6}P \) \( P = \frac{10}{3} = 3.33 \)

2. \( P = 3C \) \( Qd = Qs = 5 \) What is equilibrium P and Q?

3. \( MR = 80 - 2Q \) \( MC = 50 + 5 \) What is the equation for the marginal revenue curve (MR=f(Q))? What is the equation for the marginal cost curve (MC=f(Q))? \( 80 - 3Q = 50 + 5 \) \( 0 = -2Q = 3 \)

4. \( Q = 3 \) \( Q = 3 \) What is the Q that maximizes producer surplus?

5. \( P = 50 \) \( P = 50 \) What is the P which maximizes producer surplus?

6. What is the change in consumer surplus caused by the monopoly?

7. Draw a rough diagram, clearly showing equilibrium (#2) and the P & Q for the monopoly (#5 & #6).

8. \( 20 = \left( \frac{8+4}{2} \right) ^2 = -80 \) What is the change in consumer surplus caused by the monopoly?

9. \( 45 = \left( \frac{8+4}{2} \right) ^2 = 112.5 \) What is the producer surplus for the monopoly?

10. \( 45 = \left( \frac{8+4}{2} \right) ^2 = 112.5 \) What is the change in producer surplus caused by the monopoly/price searching?

11. \( \frac{30}{2} = -30 \) What is the dead weight loss caused by price searching?