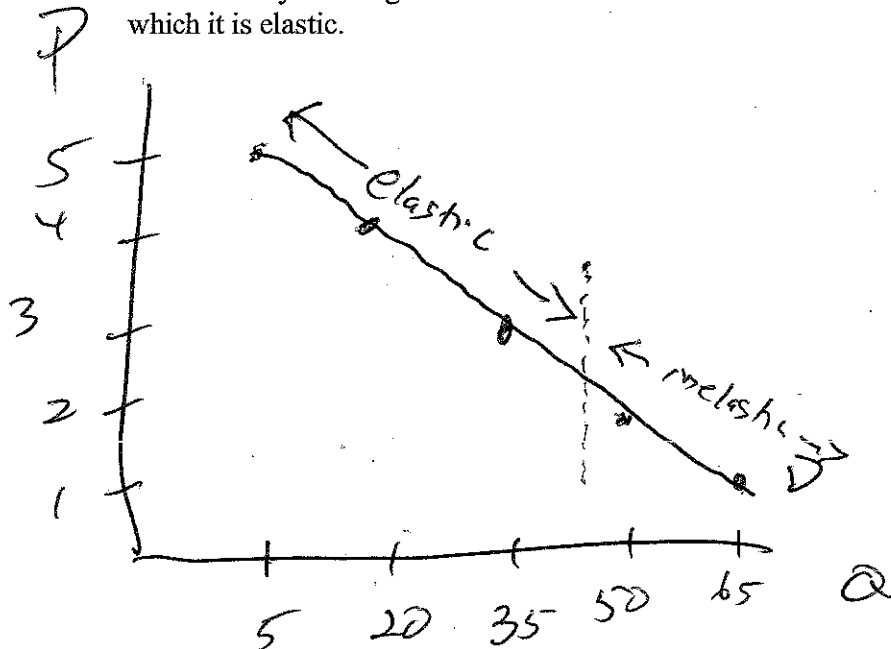


The total exam is worth 25 points. Each numbered question is worth 2 ½ points, and each sub question within a numbered question is worth an equal share of the 2 ½ points.

- 1) The demand curve is given to you as $Q=80-15p$.
- Fill out the following table (use the relatively higher price / relatively lower quantity pair in the elasticity calculation).

Price	Quantity	Elasticity
\$1.00	$80 - 15 = 65$	-----
\$2.00	$80 - 30 = 50$	$\frac{-15 \cdot 2}{1 \cdot 50}$ or $\frac{-15}{\frac{50}{2}} = -\frac{3}{5}$
\$3.00	$80 - 45 = 35$	$\frac{-15 \cdot 3}{1 \cdot 35}$ or $\frac{-15}{\frac{35}{3}} = -\frac{9}{7}$
\$4.00	$80 - 60 = 20$	$\frac{-15 \cdot 4}{1 \cdot 20}$ or $\frac{-15}{\frac{20}{4}} = -3$
\$5.00	$80 - 75 = 5$	$\frac{-15 \cdot 5}{1 \cdot 5}$ or $\frac{-15}{\frac{5}{5}} = -15$

- Draw this demand curve with price on the y-axis and quantity on the x-axis. Identify the range over which the demand curve is inelastic and over which it is elastic.



2) Say that you know that the inverse demand curve for SU sweatshirts is: $p=50 - (1/2) \cdot Q_d$ (where p is the price per sweatshirt and Q_d is the quantity of sweatshirts demanded), and the (inverse) supply curve can be expressed in a similar fashion by $p=(1/2) \cdot Q_s - 4$.

a) What is the equilibrium price quantity pair if the market for SU sweatshirts is perfectly competitive?

$$\begin{array}{r} 50 - \frac{1}{2}Q = \frac{1}{2}Q - 4 \\ +4 \qquad \qquad \qquad +4 \end{array}$$

$$\begin{array}{r} 54 - \frac{1}{2}Q = \frac{1}{2}Q \\ +\frac{1}{2}Q \qquad \qquad +\frac{1}{2}Q \end{array}$$

$$54 = Q$$

$$p = \frac{1}{2}(54) - 4 \quad \Bigg| \quad p = 50 - \frac{1}{2}Q$$

$$= 27 - 4 = 23 \quad \Bigg| \quad = 50 - 27 = 23$$

$$(p^e, q^e) = (23, 54)$$

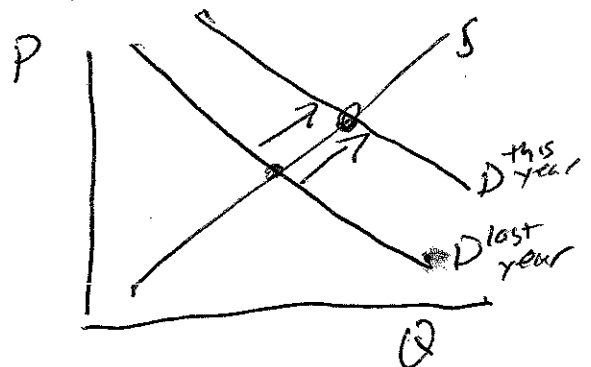
b) If the equilibrium you solved for in (a) is for last year, and we assume there is increased demand due to excitement about the basketball team winning so many games this year, how would this year's equilibrium compare to last year's (circle the correct answer)?

i. Higher price, lower quantity

ii. Higher price, higher quantity

iii. Lower price, lower quantity

iv. Lower price, higher quantity



3) You are given that $p=50-4q$ is the inverse demand curve and $p=10+6q$ is the inverse supply curve.

a. What is the equilibrium price quantity pair if the market is perfectly competitive?

$$\begin{array}{r} 50 - 4q = 10 + 6q \\ -10 \quad \quad -10 \\ \hline 40 - 4q = 6q \end{array}$$

$$\begin{array}{r} 40 - 4q = 6q \\ +4q \quad \quad +4q \\ \hline 40 = 10q \end{array}$$

$$40 = 10q$$

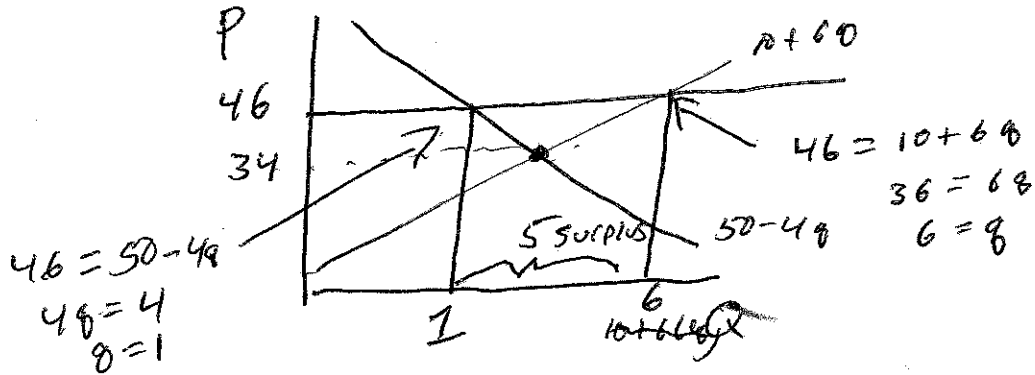
$$4 = q$$

$$(P^*, q^*) = (34, 4)$$

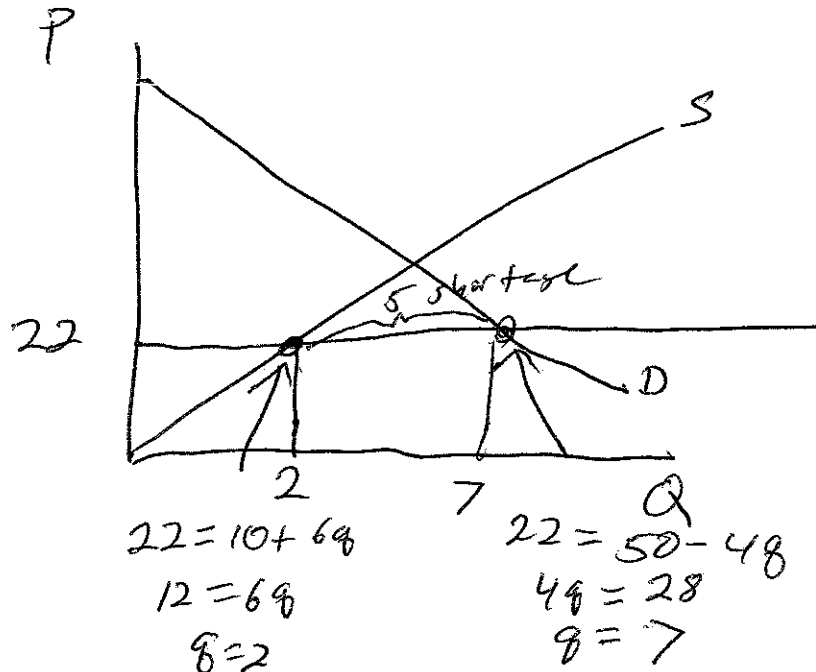
$$\begin{aligned} P &= 50 - 4(4) \\ &= 50 - 16 = 34 \end{aligned}$$

$$P = 10 + 6 \cdot 4 = 10 + 24 = 34$$

b. Illustrate the effect of a price floor set at \$46 on the graph and solve for the size of the difference between the quantity supplied and quantity demanded.



c. Illustrate the effect of a price ceiling set at \$22 on the graph and solve for the size of the difference between the quantity supplied and quantity demanded.



4) A local ski area is considering raising the price of an annual pass from \$800 to \$900. The number of annual passes sold currently at a price of \$800 is 1,000. The best available information suggests that the price elasticity of demand for annual passes is -1.6. Answer the following questions.

a. What is the predicted membership level after the price is raised?

$$-1.6 = \frac{\% \Delta Q}{\% \Delta P} \quad \Delta P? \quad 100 \quad P? \quad 800$$

$$-1.6 = \frac{\frac{\Delta Q}{1000}}{\frac{100}{800}} \quad Q? \quad 1,000$$

$$-1.6 \left(\frac{1}{8}\right) = \% \Delta Q$$

$$-20\% = \% \Delta Q$$

$$\Delta Q = -200, \quad Q_{new} = 800$$

b. Compare total revenue for the ski area at the annual pass fee of \$800 and at the price of \$900. Which is higher?

$$TR_{800} = \overset{P}{800} \cdot \overset{Q}{1000} = 800,000$$

$$TR_{900} = 900 \cdot 800 = 720,000$$

c. Will a price decrease for the annual fee to \$700 from \$800 raise or lower annual revenue? By how much?

$$-1.6 = \frac{\% \Delta Q}{\% \Delta P}$$

$$-1.6 = \frac{\% \Delta Q}{\frac{-100}{800}}$$

$$+20\% = \% \Delta Q = \frac{\Delta Q}{1000}$$

$$-20(1000) = \Delta Q = 200$$

$$\text{new } Q = 1,200$$

$$TR_{700} = 700(1,200) = 840,000$$

Raise by 40,000

- 5) I know the price of one slice of pizza is \$2.00 and the price of one cup of coke is \$1.00 per unit. The marginal utility of pizza at a bundle the consumer is considering buying is 4 and the marginal utility of coke is 4. This bundle is on the budget line.

- a. Is the bundle the consumer is considering buying is the optimal bundle? Why or why not?

$$P_p = 2 \quad P_c = 1$$

$$MU_p = 4 \quad MU_c = 4$$

$$MRT = -\frac{P_p}{P_c} = -\frac{2}{1}$$

$$MRS = -\frac{MU_p}{MU_c} = -\frac{4}{4}$$

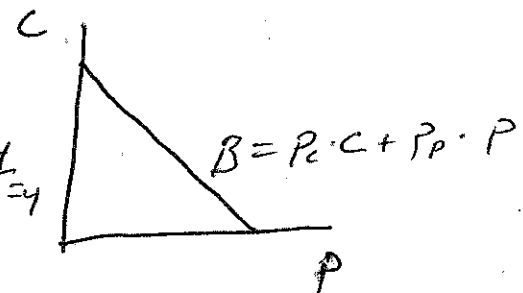
$$MRS \neq MRT$$

or

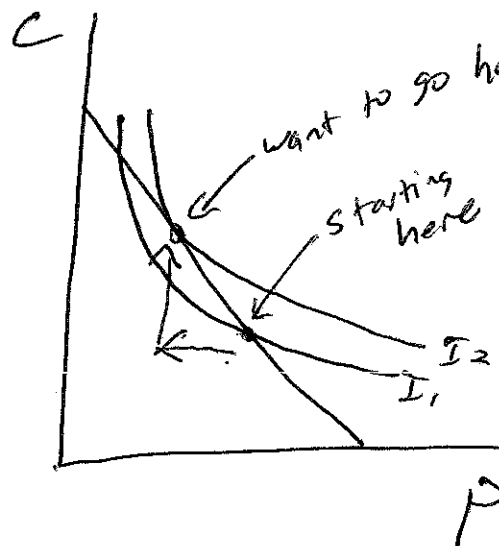
$$\frac{MU_c}{P_c} = \frac{4}{1} = 4$$

$$\frac{MU_p}{P_p} = \frac{4}{2} = 2$$

Not meeting least dollar rule?



- b. Show on graph that illustrates with two indifference curves and one budget constraint the consumption bundle described in the introduction to this problem and the optimal bundle.



why?
 MRT steeper than MRS
 at starting bundle

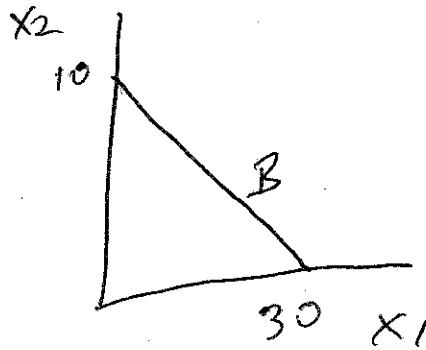
— or —

$$\frac{MU_c}{P_c} > \frac{MU_p}{P_p}$$

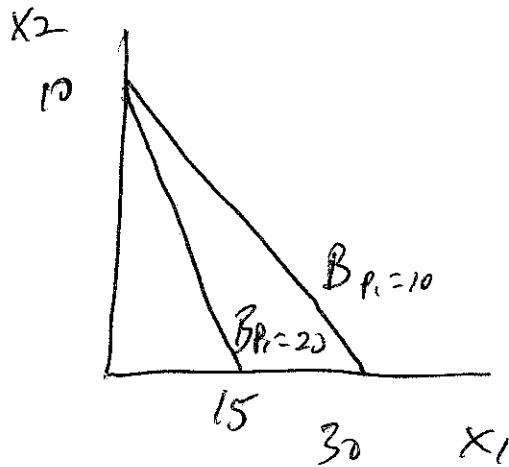
↓ MU_c , ↑ MU_p

Consume more coke
 and less pizza

- 6) If $p_1 = 10$, $p_2 = 30$, and $Y = 300$
a. Draw the budget constraint.



- b. Draw the budget line if $p_1 = 10$ changes to $p_1 = 20$ all else constant



7) Circle whether the statement is true or false:

- a. A good for which there is an inelastic price elasticity of supply has a smaller percent change in quantity than the corresponding percent change in price.

TRUE

FALSE

$$\epsilon = \frac{\% \Delta Q}{\% \Delta P}$$

inelastic $\left| \frac{\% \Delta Q}{\% \Delta P} \right| < 1$
 $\Rightarrow \left| \frac{\% \Delta Q}{\% \Delta P} \right| < 1$

- b. Indifference curves can cross since more is better than less.

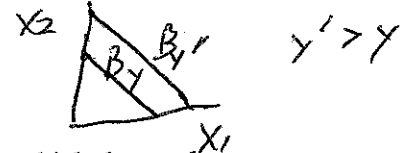
TRUE

FALSE

- c. The opportunity set becomes larger when a consumer's income increases

TRUE

FALSE



- d. The slope of the indifference curve reflects the rate at which the market allows the consumer to transform one commodity into another holding prices and income constant.

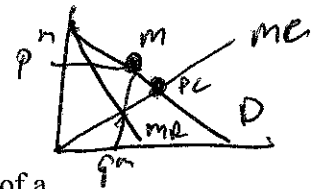
TRUE

FALSE

- e. A monopolist will charge a higher price and supply a lower quantity in comparison to a perfectly competitive market.

TRUE

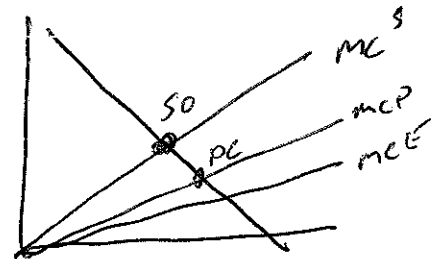
FALSE



- f. If there is a negative externality generated in the production of a commodity and it is sold in a perfectly competitive market, the price of the good will be greater than is socially optimal and quantity produced will be less than what is socially optimal.

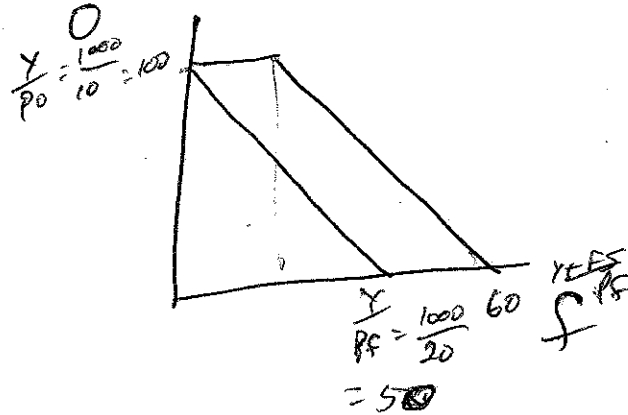
TRUE

FALSE

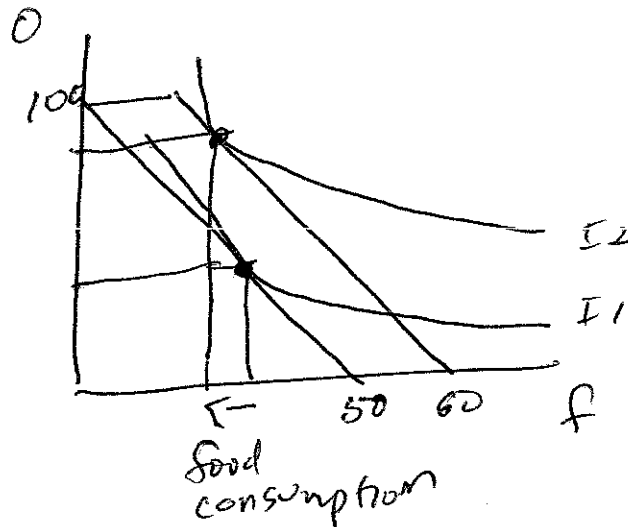


8) A food stamp policy is put in place in a state. For our representative consumer impacted by this policy, their initial income of \$1,000 is supplemented by a cash value of food stamps of \$200. The initial budget constraint is $y = p_f \cdot f + p_o \cdot o$, where f is food, o is all other goods, and the two prices are subscripted by their commodity. The price of food is \$20 per unit, the price of other is \$10 per unit.

- a. Draw the original budget line and the budget line after the food stamp policy is implemented.

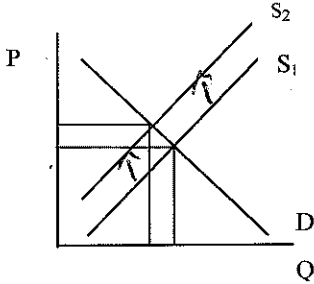


- b. Representative McPeak is outraged to find out recent studies indicate that spending on other goods went up by 15% following the implementation of the food stamp policy. He says this shows that there is mass corruption in the administration of the program and the program should be abolished since it is being misused. Illustrate for him on a graph why increased spending on other goods as a result of the policy could occur for reasons other than corruption.



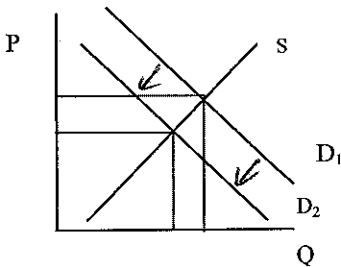
- 9) The good in question is a bag of salt used to melt snow on residential sidewalks. Provide a (no more than 2 sentence) story for each of the following shifts that could explain what has changed in the real world to bring about such a shift. You are making a story up that would lead to the observed change.

a. What could have caused the shift from S_1 to S_2 ?



- Salt mines increase price per pound of salt that snow melting salt makers use
- Local salt supplier goes out of business after mining all the salt, forcing producers to purchase more expensive salt from other states.

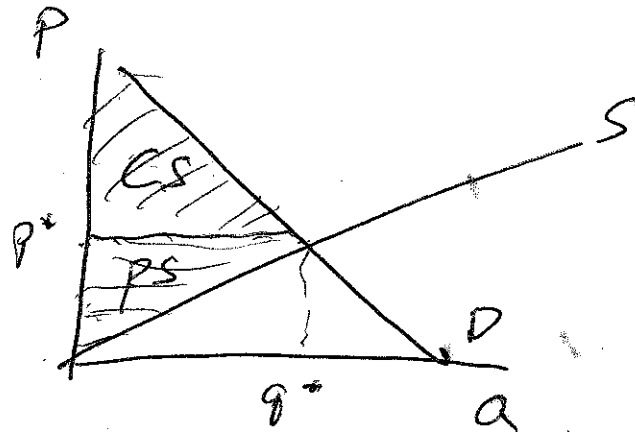
b. What could have caused the shift from D_1 to D_2 ?



- D_1 is last year that was really snowy and icy.
- D_2 is this year which is not very snowy and icy

10) On a graph of a perfectly competitive market:

- a. Identify the areas corresponding to consumer surplus and producer surplus



- b. Explain the meaning of producer surplus – why is it a measure of producer benefits from participating in a market?

Sellers get p^* per unit produced and sold. What they need to get at a minimum for each unit of q is traced out by the supply curve (as the MC curve).

Since $p^* > MC(q)$ for $q = 0$ to q^* , producers benefit from being paid more than it costs to supply.

- c. Explain the meaning of consumer surplus – why is it a measure of consumer benefits from participating in a market?

Buyers pay p^* per unit purchased.

What they would have been willing to pay is reflected in the demand curve if we interpret it as a willingness to pay curve. They were willing

to pay more per unit than they had to, so the area under the demand curve and above the price line is consumer surplus.