

**Econ 101.001
Assignment Two
Solutions**

A. Indicate if the following statements are true (T) or False (F) and explain your answer. Please use the space provided to illustrate your answer with a diagram.

1. The market demand curve of a good is formed by adding up the willingness to pay of each individual at each price.

False

The market demand curve is found by adding up the quantities demanded of each individual at each price. The answer to this question is found in your textbook on page 108 and in figure 5.1.

2. If the marginal utility per dollar spent on good X exceeds the marginal utility per dollars spent on good Y, total utility will increase by increasing consumption of good X and decreasing consumption of good Y.

True

Increasing consumption of X causes MU_X to decrease. Decreased consumption of Y causes MU_Y to increase. This cause the ratio of marginal utilities per dollar to increase and total utility to be maximized. The answer to this question can be found in your textbook on pages 183-186.

3. The average variable cost reaches it minimum at the same level of output at which average product is maximized.

True

Where W is the wage, and WL is the total wage bill:

$AVC = TVC/Q = WL/Q = W/(Q/L) = W/AP$ (see your textbook pages 257-261)

4. Technologically efficient production methods use relatively less of high-cost resources and relatively more of lower-cost resources.

False

Technological efficiency occurs when a firm produces output using the lowest levels of inputs of all other possible input combinations. It is possible that a technologically efficient production method is produced using relatively less of high-cost resources and relatively more of lower-cost resources, but this is not necessary for technological efficiency. This is the same as saying that technologically efficient production methods are not necessarily economically efficient, on the other hand economically efficient allocations are always technologically efficient.

B. Please answer the following short answer question in the space provided.

1. In the space below, with the help of an illustration, please write an explanation as to why it is logically impossible for indifference curves to intersect each other.

To answer this you need to draw a graph with two indifference curves that are crossed and then make the following argument. The consumption point at which the two curves cross must give the consumer an identical level of utility – because they consume an identical level of both goods. Given that an indifference curve, by definition, is a series of points along which the consumer is equally happy then if the indifference curves cross the consumer must also be indifferent between the curves themselves at all other points. The problem with this is that for all combinations of goods not at the point of intersection, this implies that people are indifferent between two bundles in which one of which has more of both goods. That is logically inconsistent if we believe that a person will always prefer a bundle with more to a bundle with less.

C. Answer the following questions in the space provided. Please be certain to illustrate your answers with the appropriate diagram(s) and show all of your work.

1. The demand for quips is

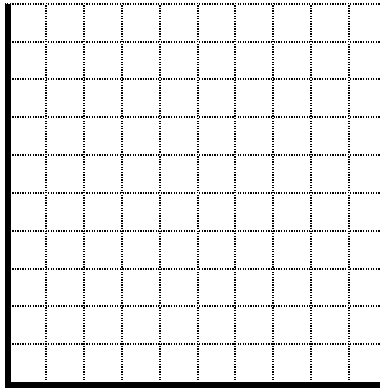
$$P = 80 - 1Q_D$$

The supply of quips is

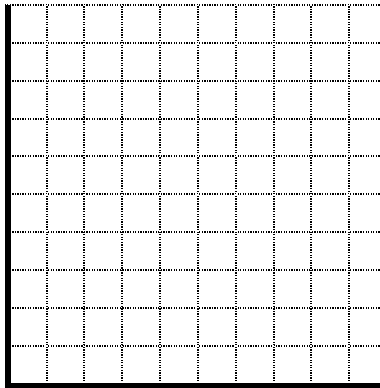
$$P = 10 + 0.75 Q_S$$

Assume initially that the market for quips is in equilibrium.

- a. Use the grid below illustrate this equilibrium, label the axis and the numeric values for Q^* and P^* , and shade in the area that represents consumer and producer surplus.



- b. Calculate the consumer surplus. *Consumer surplus* = $\frac{1}{2} * 40 * 40 = 800$
- c. Calculate the producer surplus. *Producer surplus* = $\frac{1}{2} * 40 * 30 = 600$
- d. Imagine that production is restricted to 20 quips, redraw your diagram and indicate the deadweight loss from this underproduction.



- e. Calculate the deadweight loss. *Deadweight loss* = $\frac{1}{2} * 35 * 20 = 350$.

2. Shanshan drinks both regular coffee and cappuccinos. Coffee cost \$1 per cup and cappuccinos cost \$2 per cup. Shanshan has decided to budget \$12 per week for hot beverages. The grids on the following page should be used to illustrate all parts of this question. Please be certain to label your diagrams carefully.

- a) If we know that Shanshan consumes three cappuccinos and six coffees per week, draw both her budget constraint and an indifference curve that represents her preferences. Label the consumption point "A" and in the space below show how you derived her budget line.

$$\begin{aligned}
 \text{Income} &= \text{Expenditure} \\
 12 &= 1 * Q_{\text{coffee}} + 2 * Q_{\text{capps}} \\
 Q_{\text{capps}} &= 6 - \frac{1}{2} Q_{\text{coffee}}
 \end{aligned}$$

- b) Suppose that when the cost of a cappuccino falls to 1\$, Shanshan changes her consumption to six cappuccinos and six coffees per week. Now draw both her new budget constraint and an indifference curve that represents her preferences given the new price of cappuccinos. Label the consumption point “B” and in the space below show how you derived her budget constraint.

$$\begin{aligned} \text{Income} &= \text{Expenditure} \\ 12 &= 1 * Q_{\text{coffee}} + 1 * Q_{\text{capps}} \\ Q_{\text{capps}} &= 12 - 1 * Q_{\text{coffee}} \end{aligned}$$

- c) Of the total increase in cappuccinos how much is due to the substitution effect? [Note here that your answer, and the answer to part d), is completely determined by the shape of the indifference curve you drew.]

Depends on how the indifference curve is draw. It does require that you find the point that is on the original indifference curve and is tangent to a hypothetical budget constraint that has the same slope as the new budget constraint (a slope of 1). Your answer should be a number between one and three.

- d) Of the total increase in cappuccinos how much is due to the income effect?

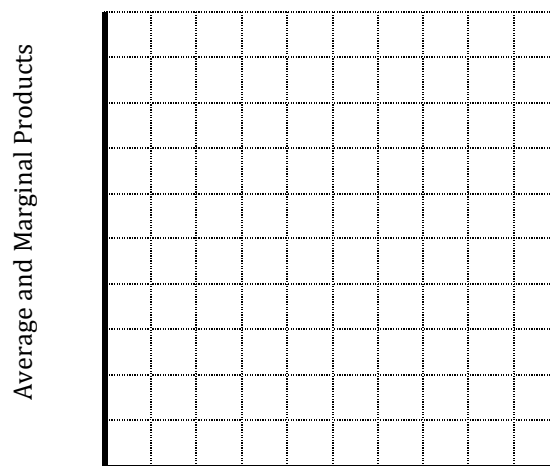
This is just the difference between the total increase in cappuccinos – 3 – and the number you found in part c). It essentially measures how much the hypothetical indifference curve in part c) has to shift to be tangent to the new indifference curve drawn in part b).

- e) On the grid below plot two points on Shanshan’s demand curve for cappuccinos and draw a straight-line demand curve.
- f) Shanshan decides to increase her hot beverage budget, given the new price of cappuccinos, to \$14. She now consumes 7 cappuccinos and 7 coffees. Draw on your diagram her new budget constraint and an indifference curve that represents her preferences. Label that consumption point “C” and illustrate how this increase in income changes the demand curve.

3. For a given scale of plant, the table below gives the total monthly output of yelps (Q) attainable using varying quantities of labour (L).

L	Q	MP	AP	TFC	TVC	TC	MC	AFC	AVC	ATC
0	0		0	2000	0	2000		-	-	-
1	1		1.00	2000	2000	4000		2000	2000	4000
2	3		1.50	2000	4000	6000		667	1333	2000
3	6		2.00	2000	6000	8000		333	1000	1333
4	12		3.00	2000	8000	10000		167	667	833
5	17		3.40	2000	10000	12000		118	588	706
6	20		3.33	2000	12000	14000		100	600	700
7	22		3.14	2000	14000	16000		91	636	727
8	23		2.88	2000	16000	18000		87	696	783

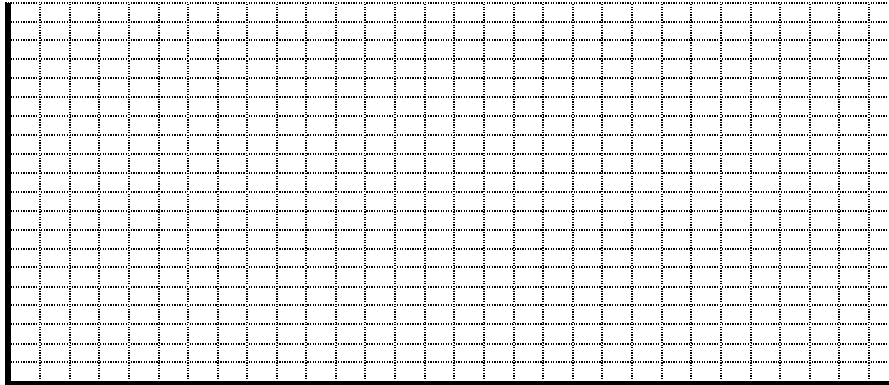
- a) Complete the table above for marginal product of labour (MP) and average product of labour (AP). Note that marginal product of labour should be entered midway between the rows to emphasize that it is the result of changing inputs – moving one row to the next. Average product corresponds to a fixed quantity and should be entered on the row.
- b) Plot this data on the grid below. MP should be plotted on midway points.



Labourers per month

c) If the cost of one labourer is \$2,000 per month and total fixed cost is \$2,000 per month complete the table above by computing total fixed cost (TFC), total cost (TC), marginal cost (MC), average fixed cost (AFC), average variable cost (AVC) and average total cost (ATC). Note that as above, the marginal cost should be entered midway between the rows.

d) Clearly label your axis and draw TC, TVC, and TFC on in the grid below.



e) Label the axis and draw the MC, ATC, AVC, and AFC curves on the graph below. MC should be plotted midway between the output points.

