

Don't Worry. Be Happy!

Mayer's Guide to AP Microeconomics
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AP MICROECONOMICS

UNIT 1

Basic Economic Concepts



12–15%
AP EXAM WEIGHTING



~9–11
CLASS PERIODS



Remember to go to [AP Classroom](#) to assign students the online **Personal Progress Check** for this unit.

Whether assigned as homework or completed in class, the **Personal Progress Check** provides each student with immediate feedback related to this unit's topics and skills.

Personal Progress Check 1

Multiple-choice: ~20 questions

Free-response: 2 questions

- Short
- Short

Basic Economic Concepts



Developing Understanding

BIG IDEA 1

Scarcity and Markets **MKT**

- How do individuals and economies confront the problem of scarcity?
- Why do people and countries trade with one another?

BIG IDEA 2

Costs, Benefits, and Marginal Analysis **CBA**

- Why do all decisions have costs?
- Why do people consider the additional costs and benefits of possible actions rather than just the total costs and benefits when making decisions?

To understand economics, students need to understand that because most resources are scarce, individuals and societies must make choices. When making rational choices, people do so “on the margin,” taking into account the additional costs and benefits of their decisions. The foundational economic ideas addressed in this unit form the basis for more advanced analysis of consumer and producer behavior that will be developed throughout the course.

Building Course Skills

1.A 1.C 1.D 2.C 4.A

This unit focuses on providing students with a thorough understanding of basic economic concepts. They need this understanding to be able to apply these concepts in subsequent units as the content increases in difficulty. Many students have not had significant exposure to the study of economics in previous coursework, which means that thinking like an economist (e.g., evaluating decisions based on constraints and trade-offs and thinking on the margin) may not come naturally. Students can begin to develop this skill set early on by using simulations and examples relevant to their lives. For example, if students engage in a simulation in which they consume additional units of a good and record the utility of consuming each additional unit (please refer to the sample activities for Unit 1 on p. 33), they will be better able to understand marginal decision making and the concept of diminishing marginal utility. By actually experiencing these concepts, students will be better equipped to describe them in their own words and apply them in later contexts.

Preparing for the AP Exam

Questions that require students to analyze quantitative data and perform calculations to demonstrate their mastery of consumer theory are a frequent challenge area on the AP Exam. While many students grasp the concept of consumer optimization, they are unable to apply that understanding using numbers. To prepare students for the exam, spend time first grounding students conceptually in the principles and logic behind consumer theory and then reinforce this learning by providing opportunities for students to practice using numerical examples. Students should understand the importance of showing their work when doing any calculations in the course.

Graphical models are first introduced in this unit. Graphing is an important skill in this course that will be tested in the free-response section of the AP Exam. It's helpful to model how to set up their graphs in this unit and throughout the course, stressing the importance of properly labeling axes and curves, and providing opportunities for students to practice setting up graphs themselves and interpreting situations represented graphically.

UNIT AT A GLANCE

Enduring Understanding	Topic	Suggested Skills	Class Periods
			~9–11 CLASS PERIODS
MKT-1	1.1 Scarcity	1.A Describe economic concepts, principles, or models.	.5
	1.2 Resource Allocation and Economic Systems	1.D Describe the similarities, differences, and limitations of economic concepts, principles, or models.	.5
	1.3 Production Possibilities Curve	4.A Draw an accurately labeled graph or visual to represent an economic model or market.	1
MKT-2	1.4 Comparative Advantage and Trade	1.C Identify an economic concept, principle, or model using quantitative data or calculations.	2
CBA-1	1.5 Cost-Benefit Analysis	1.C Identify an economic concept, principle, or model using quantitative data or calculations.	1
CBA-2	1.6 Marginal Analysis and Consumer Choice	2.C Interpret a specific economic outcome using quantitative data or calculations.	2
 Go to AP Classroom to assign the Personal Progress Check for Unit 1. Review the results in class to identify and address any student misunderstandings.			

SAMPLE INSTRUCTIONAL ACTIVITIES

The sample activities on this page are optional and are offered to provide possible ways to incorporate various instructional approaches into the classroom. Teachers do not need to use these activities or instructional approaches and are free to alter or edit them. The examples below were developed in partnership with teachers from the AP community to share ways that they approach teaching some of the topics in this unit. Please refer to the Instructional Approaches section beginning on p. 105 for more examples of activities and strategies.

Activity	Topic	Sample Activity
1	1.1	Real-World Examples Remove a few desks from the classroom so that on the first day of class there aren't enough desks for each student. When students recognize the problem, discuss how the class will decide who gets a desk. This is a good way to introduce the problem of scarcity. It allows students to discuss trade-offs and resource allocation.
2	1.3	Graph and Switch Create a list of situations that can be illustrated with the production possibilities curve. Pair students and distribute a small whiteboard to each student. Read a scenario and instruct students to draw a graph that represents the situation. Then have students share their graphs with their partner and provide feedback to each other.
3	1.5	Authentic Tasks Assign students to investigate the total costs and benefits of a decision relevant to their lives. For example, students might research the total costs and benefits of receiving a college degree. Then have students evaluate whether that decision makes sense by comparing total benefits and total costs.
4	1.6	Simulation and Debriefing Carry out a classroom simulation where students consume additional units of a good (e.g., glasses of water, marshmallows, or pieces of candy) and record the utility of consuming each additional unit on a scale of 1–10. Debrief the activity as a class to connect the experience to the concepts of marginal decision making and diminishing marginal utility.



Unit Planning Notes

Use the space below to plan your approach to the unit. Consider how you want to pace your course and methods of instruction and assessment.

1. Absolute Advantage

The ability to produce more of a good or service than another person or society with the same number of inputs. Alternatively, it means one person or society can make a unit of output with fewer units of input than its counterpart.

2. Allocative Efficiency

The amount of production that benefits society the most. It is achieved when the marginal benefit of production equals the marginal cost. Also known as the socially optimal level of output. A society is allocatively efficient when it is choosing to make the mix of goods that best satisfy the wants of its population.

3. Capital

The tools, machines, factories, and buildings used to produce goods and services. Includes physical capital, which ranges from hammers to industrial robots and human capital, which is “know-how” or specialized skills that get fused to labor through education and training.

4. Ceteris Paribus

“Other things being equal.” The assumption that all variables remain constant except for those being studied by the economist. Ceteris paribus allows economists to understand the relationship between economic variables. As in science, economists like to try to isolate one factor that may be changing at a given time to better understand cause and effect.

5. Circular Flow

A model or diagram showing how households and firms interact in product and resource markets. Circular flow models help visualize how expenditures become income and how market types relate to one another. Complex versions of the circular flow can include activities of government in regulating or participating in various markets and/or international trade.

6. Command Economy

An economic system in which government planners make most of the choices for the economy and answer the basic questions of what to produce, how to produce, and for whom to produce. Often contrasted with market economy because these are the two basic extremes; societies can choose strategies for managing the scarcity problem that place them along the spectrum between these two extremes.

7. Comparative Advantage

The ability to produce a good or service at a lower opportunity cost than someone else. Having comparative advantage in production of a good is the basis of the economic argument for why specialization and trade can benefit two individuals or societies.

8. Economics

The study of the choices that presumptively rational people make to get what they need and want given the condition of scarcity. This field of inquiry is divided into macroeconomics—which concerns itself with how societies manage scarcity—and microeconomics—which primarily focuses on how firms and households make choices based on incentives to achieve their objectives.

9. Economist

An individual who studies economics.

10. Entrepreneur

An individual who possesses the factor of production called entrepreneurship. Entrepreneurs run firms that attempt to maximize profit.

11. Entrepreneurship

The special ability of some individuals to take risks and combine land, labor, and capital in new ways in order to make profits by providing a good or service instead of selling their labor to an employer.

12. Factors of Production

The resources used to produce goods and services. These include land, labor, capital, and entrepreneurship.

13. Labor

People's mental and/or physical effort and skill used in producing goods and services.

14. Land

Natural resources used in producing goods and services. An economist's definition of land includes land area and the minerals, oil, timber, and other useful bounty that the land provides. Sometimes it is even used so broadly as to be nearly synonymous with raw materials.

15. Law of Increasing Opportunity

As the production of one good increases, producers must sacrifice ever-increasing amounts of the other goods because factors of production are not perfectly interchangeable between the production of both goods.

16. Marginal Benefit

The additional benefit of consuming one extra unit of a good or service. The rate of change or slope of total benefit.

17. Marginal Cost

The additional cost of producing one extra unit of a good or service. The rate of change or slope of total cost.

18. Market

A forum for interactions between demanders wishing to make purchases and suppliers wishing to make sales. Markets exist wherever buyers and sellers meet to exchange goods, services, or the factors of production.

19. Market Economy

An economic system that relies on individuals pursuing their own self-interest in the market in order to cope with scarcity. In market systems, prices are used to guide production decisions in a decentralized manner. Buyers "vote" with their spending dollars, making those goods more expensive, thereby encouraging producers to make more of goods that are more desired and useful. Contrasted with command economy in which production decisions are made centrally.

20. Opportunity Cost

That which is given up when a choice is made about the use of a scarce resource. Opportunity cost includes explicit costs (money payments made) and implicit costs (nonmonetary costs or sacrifices)

21. Production Possibilities Curve

An economic model that shows all of the possible combinations of two goods that could be produced using scarce factors of production.

22. Production Possibilities Frontier

See Production Possibilities Curve

23. Productive Efficiency

The condition that exists when the least amount of waste happens in producing as much output as possible. When a society is using all its resources to produce goods and services, it is productively efficient.

24. Scarcity

The fundamental problem of economics. The condition that exists because people's wants and needs are greater than the available resources to meet those wants and needs.

25. Specialization

A person or society's decision to focus production on a particular good or service, leading it to trade with others for the remaining goods it needs. To achieve maximum benefit, the person or society should specialize according to their comparative advantage.

26. Terms of Trade

The rate at which people trade two goods. The ratio or "real price" for which a unit of one good can be purchased for units of another good.

27. Trade-Off

An alternative use for scarce factors of production. Tradeoffs are a result of scarcity and inherently connected to the making of choices.

SUGGESTED SKILL

*Principles and Models*

1.A

Describe economic concepts, principles, or models.

TOPIC 1.1

Scarcity

Required Course Content

ENDURING UNDERSTANDING

MKT-1

Most resources are scarce, and in most cases the use of resources involves constraints and trade-offs.

LEARNING OBJECTIVE

MKT-1.A

Define resources and the cause(s) of their scarcity.

ESSENTIAL KNOWLEDGE

MKT-1.A.1

Economic trade-offs arise from the lack of sufficient resources (scarcity) to meet society's wants and needs.

MKT-1.A.2

Most factors of production (such as land, labor, and capital) are scarce, but some factors of production (such as established knowledge) may not be scarce due to their non-rival nature.

Scarcity - the condition which exists because people always want or need more goods or resources (factors of production) than are available because they are finite. Because of scarcity, humans face trade-offs about how to best utilize relatively scarce resources.

THERE IS NO SUCH THING AS A FREE LUNCH - SOMEBODY ALWAYS HAS TO PAY THE COST.

Economics, the dismal science - the social science which studies how people deal with scarcity.

Microeconomics - the economics of individuals, firms, and industries.

Macroeconomics - the economics of societies, countries, and the world as a whole

Factors of Production/Economic Resources - the scarce resources necessary to produce goods or services

Land - natural resources

Labor - human capital (effort, skill, ability)

Capital - factories, tools, machines, equipment

Entrepreneurship - the ability of some individuals to innovate

Payments for the factors of production are as follows:

Rent - the payment for land

Wages - the payment for labor

Interest - the payment for capital

Profit - the payment for entrepreneurship

1. Provide the terms which match the definitions:

Term	Definition
	Limited resources given unlimited wants and needs
	Tools, machines, factories, equipment
	Natural resources
	Peoples' effort, ability, and skill
	Resources necessary to produce goods and services
	Some people's ability to combine resources to provide goods and services

2. Explain why scarcity is a universal problem

3. A well known dictum in economics says, "there is no such thing as a free lunch." What does this mean?

Adam Smith, an 18th century Scottish philosopher/economist, said, "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our necessities but of their advantages."

4. According to Adam Smith, what motivates people to produce goods and services for others.

Karl Marx, a 19th century German philosopher/economist, said, "From each according to his abilities, to each according to his needs."

5. According to Karl Marx, what motivates people to produce goods and services for others.

6. Which quote do you like better? Why?

1. Provide the terms which match the definitions:

Term	Definition
<i>Scarcity</i>	Limited resources given unlimited wants and needs
<i>Capital</i>	Tools, machines, factories, equipment
<i>Land</i>	Natural resources
<i>Labor</i>	Peoples' effort, ability, and skill
<i>Factors of production</i>	Resources necessary to produce goods and services
<i>Entrepreneurship</i>	Some people's ability to combine resources to provide goods and services

2. Explain why scarcity is a universal problem

people have unlimited wants and needs, but resources are limited

3. A well known dictum in economics says, "there is no such thing as a free lunch." What does this mean?

because scarcity is universal, everything we want or need has a cost associated with it.

Adam Smith, an 18th century Scottish philosopher/economist, said, "It is not from the benevolence of the butcher, the brewer, or the baker that we expect our dinner, but from their regard to their own interest. We address ourselves, not to their humanity but to their self-love, and never talk to them of our necessities but of their advantages."

4. According to Adam Smith, what motivates people to produce goods and services for others.

regard for their own self-interest

Karl Marx, a 19th century German philosopher/economist, said, "From each according to his abilities, to each according to his needs."

5. According to Karl Marx, what motivates people to produce goods and services for others.

regard for the needs of others

6. Which quote do you like better? Why?

no wrong answers here

1. Individuals and societies must make choices regarding which goods and services will be produced and consumed because

- (A) unlimited wants can only be satisfied by allocating resources efficiently
- (B) resources are insufficient to satisfy the unlimited wants of people
- (C) allocating scarce resources efficiently reduces the equitable distribution of goods
- (D) income is not equally distributed to ensure that everyone can participate in the market
- (E) a country cannot have a comparative advantage in the production of all goods

(B)

TOPIC 1.2

Resource Allocation and Economic Systems

SUGGESTED SKILL

 *Principles and Models*

1.D

Describe the similarities, differences, and limitations of economic concepts, principles, or models.

Required Course Content

ENDURING UNDERSTANDING

MKT-1

Most resources are scarce, and in most cases the use of resources involves constraints and trade-offs.

LEARNING OBJECTIVE

MKT-1.B

Define how resource allocation is influenced by the economic system adopted by society.

ESSENTIAL KNOWLEDGE

MKT-1.B.1

Resource allocation involves answering three basic questions: What goods and services to produce? How to produce those goods and services? And who consumes those goods and services?

MKT-1.B.2

Resource allocation is significantly influenced by the economic system adopted by society, such as command economy, market economy, or mixed economy. Each system involves a particular set of institutional arrangements and a coordinating mechanism for allocating scarce resources and distributing output.

A. Three Questions Every Society Must Answer

1. What do we produce? Corn or wheat? Tanks or school buses? Biological weapons or medicine?
2. How do we produce it? Is it labor intensive or capital intensive?
3. Who do we produce it for? The rich or the poor? Individuals or the state?

B. Command Economy

1. A command economy is one in which the three questions are answered by government officials who determine what is produced, how it is produced, and for whom it is produced.

C. Market Economy

1. In market economies, the three questions are answered primarily by individuals.
2. Markets are where buyers and sellers come together in order to trade with each other.
3. Market economies rely on people's self-interest to direct the factors of production to their best use because they regard those factors of production as individually owned.
4. In market economies, people are able to own private property and this gives them an incentive to produce goods or services for others so that they will get goods and services in return.

1. Define the following:

Allocation

Command Economy

Market

Market Economy

2. What are the three basic questions that any economy must answer?

3. Based on your prior knowledge, compare the benefits of a command economy with the benefits of a market economy

Command Economy Benefits	Market Economy Benefits

4. Based on your prior knowledge, compare the costs of a command economy with the costs of a market economy

Command Economy Costs	Market Economy Costs

5. The economies of most developed countries have features of both command and market systems. In your country, what goods and services are provided by markets, and which are provided by the government?

SUGGESTED SKILL

 *Graphing and Visuals*

4.A

Draw an accurately labeled graph or visual to represent an economic model or market.

TOPIC 1.3

Production Possibilities Curve

Required Course Content

ENDURING UNDERSTANDING

MKT-1

Most resources are scarce, and in most cases the use of resources involves constraints and trade-offs.

LEARNING OBJECTIVE

MKT-1.C

- Define (using graphs as appropriate) the production possibilities curve (PPC) and related terms.
- Explain (using graphs as appropriate) how the production possibilities curve (PPC) illustrates opportunity costs, trade-offs, inefficiency, efficiency, and economic growth or contraction under various conditions.
- Calculate (using data from PPCs or tables as appropriate) opportunity cost.

ESSENTIAL KNOWLEDGE

MKT-1.C.1

The PPC is a model used to show the trade-offs associated with allocating resources.

MKT-1.C.2

The PPC can be used to illustrate the concepts of scarcity, opportunity cost, efficiency, underutilized resources, and economic growth or contraction.

MKT-1.C.3

The shape of the PPC depends on whether opportunity costs are constant, increasing, or decreasing.

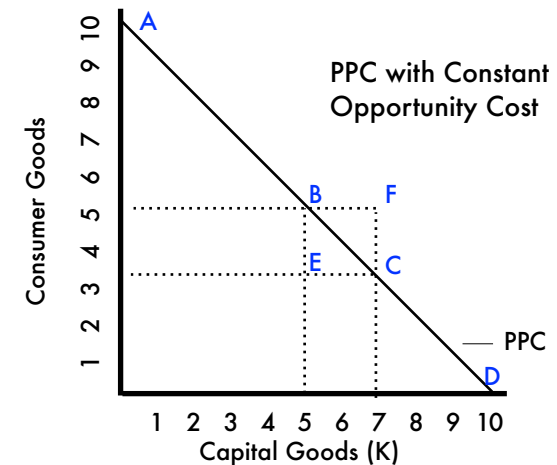
MKT-1.C.4

The PPC can shift due to changes in factors of production as well as changes in productivity/technology.

MKT-1.C.5

Economic growth results in an outward shift of the PPC.

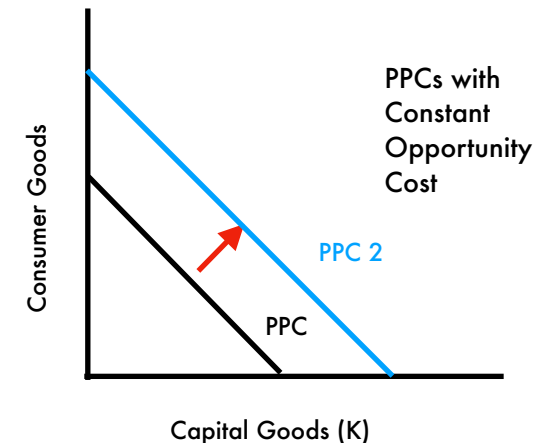
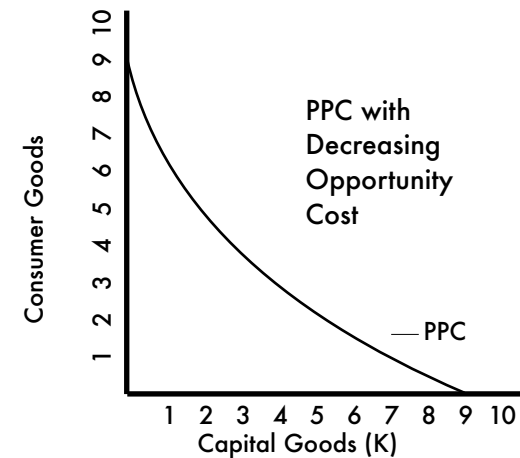
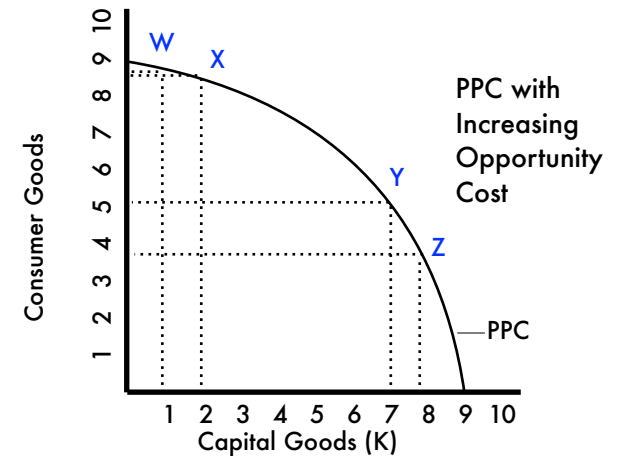
- The PPC is a model used to demonstrate the full employment level of output and to illustrate changes in full employment. Full employment means using all available resources with the least amount of waste. When an economy is at full employment it is productively efficient.
- The PPC illustrates scarcity because there is a limited combination of goods which can be produced (refer to graph: at most either 10 consumer goods or 10 capital goods can be produced). Full employment implies a limit to what can be produced at any given time.
- The trade-offs are the axis labels used in the model. The model is limited to analyzing two trade-offs. This economy can produce either capital goods or consumer goods, and people in the economy must choose which and how much to produce.
- Opportunity cost is illustrated by moving from one production combination to another production combination. For example, if the economy is at point B and policymakers want to increase the production of capital goods by two units, then the opportunity cost of moving from B to C is 2 fewer consumer goods are able to be produced.
- Full Employment is illustrated in the PPC when a combination of goods produced is on the curve (see points A, B, C, & D in graph).
- Underutilization of resources is illustrated when a point lies inside the curve (see point E in graph).
- Unattainable combinations are illustrated as points outside the curve (see point F in graph).



Topic 1.3 Production Possibilities Curve (PPC)

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- The shape of the PPC depends on whether opportunity costs are constant (previous page), increasing (top graph), or decreasing (middle graph)

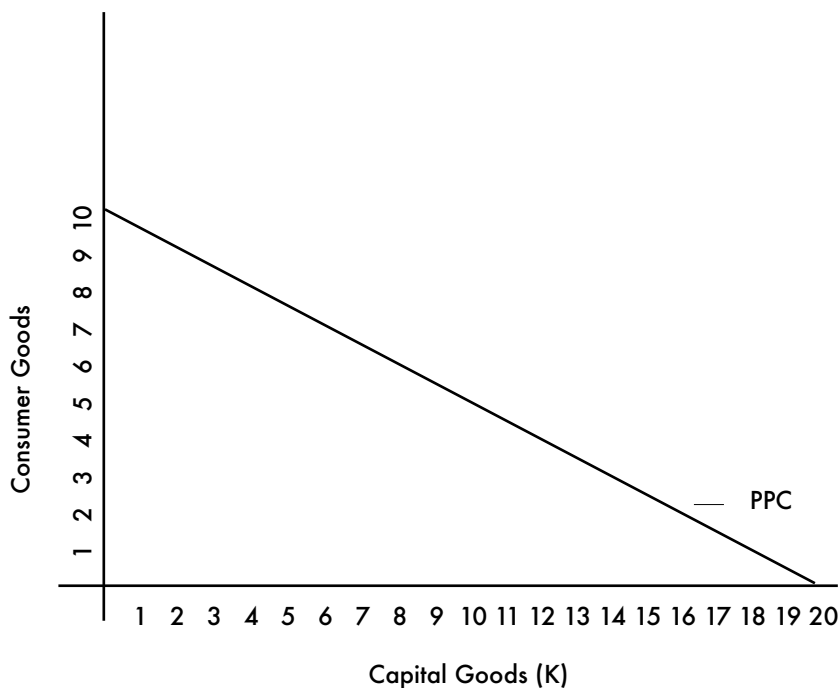


- Constant opportunity cost occurs when the opportunity cost of producing each additional unit of either type of good remains the same. This happens when resources are perfectly suited for producing either good.
- Increasing opportunity cost occurs when the opportunity cost of producing each additional unit of either type of good increases as production increases (see W to X vs. Y to Z in middle graph). This happens when resources are not perfectly suited for producing either good.
- Decreasing opportunity cost occurs when the opportunity cost of producing each additional unit of either type of good decreases as production increases. Not realistic for most goods.
- Economic growth can be illustrated by the entire PPC shifting outward (see the change from PPC to PPC2 in the bottom graph).
- Economic contraction can be illustrated by shifting the entire PPC inward.
- The PPC can shift directly because of changes in the quantity and/or quality of the factors of production as well as changes in productivity/technology (in bottom graph see change from PPC to PPC 2 modeling economic growth)

1. In the space below, draw a production possibilities curve with increasing opportunity cost and label the trade-offs as consumer goods and capital goods.

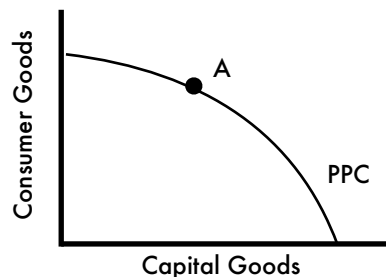
2. Label a point A on the graph you created in question 1 which illustrates an economy being productively efficient

Please refer to the graph below to answer the following questions:



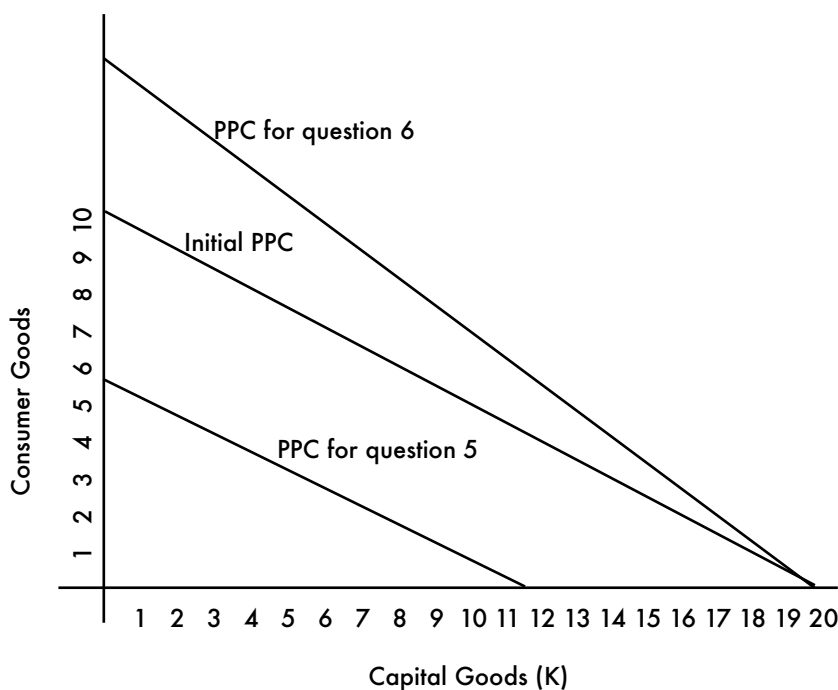
3. What type of opportunity cost is illustrated in this graph?
4. What is the opportunity cost of increasing capital goods production from 0 units to 20 units?
5. Assume labor productivity decreases in both the consumer goods and the capital goods industries. Illustrate the effect of this decrease in productivity on the graph above.
6. Assume the economy returns to the initial PPC. Now, using the graph above show how an increase in productivity in the consumer goods industry only would affect the PPC.

1. In the space below, draw a production possibilities curve with increasing opportunity cost and label the trade-offs as consumer goods and capital goods.



2. Label a point A on the graph you created in question 1 which illustrates an economy being productively efficient see graph

Please refer to the graph below to answer the following questions:



3. What type of opportunity cost is illustrated in this graph? Constant opportunity cost
4. What is the opportunity cost of increasing capital goods production from 0 units to 20 units?
10 units of consumer goods
5. Assume labor productivity decreases in both the consumer goods and the capital goods industries. Illustrate the effect of this decrease in productivity on the graph above. See graph
6. Assume the economy returns to the initial PPC. Now, using the graph above show how an increase in productivity in the consumer goods industry only would affect the PPC. See graph

TOPIC 1.4

Comparative Advantage and Trade

SUGGESTED SKILL

 *Principles and Models*

1.C

Identify an economic concept, principle, or model using quantitative data or calculations.



Required Course Content

ENDURING UNDERSTANDING

MKT-2

The consequences of scarcity can be mitigated through specialization in production and by exchange.

LEARNING OBJECTIVE

MKT-2.A

- Define absolute advantage and comparative advantage.
- Determine (using data from PPCs or tables as appropriate) absolute and comparative advantage.

MKT-2.B

- Explain (using data from PPCs or tables as appropriate) how specialization according to comparative advantage with appropriate terms of trade can lead to gains from trade.
- Calculate (using data from PPCs or tables as appropriate) mutually beneficial terms of trade.

ESSENTIAL KNOWLEDGE

MKT-2.A.1

Absolute advantage describes a situation in which an individual, business, or country can produce more of a good or service than any other producer with the same quantity of resources.

MKT-2.A.2

Comparative advantage describes a situation in which an individual, business, or country can produce a good or service at a lower opportunity cost than another producer.

MKT-2.B.1

Production specialization according to comparative advantage, not absolute advantage, results in exchange opportunities that lead to consumption possibilities beyond the PPC.

MKT-2.B.2

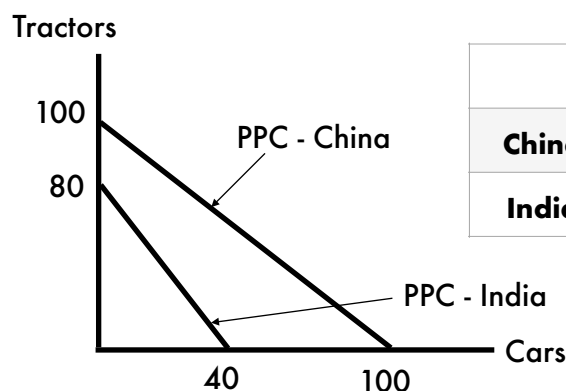
Comparative advantage and opportunity costs determine the terms of trade for exchange under which mutually beneficial trade can occur.

AVAILABLE RESOURCES

- External Resource > [Davidson Next AP Macroeconomics Course—Comparative Advantage & Trade](#)
- Classroom Resources >
 - [International Economics and the AP Microeconomics Course](#)
 - [International Economics—The Basics of Absolute and Comparative Advantage](#)

Absolute advantage – describes a situation in which an individual, business, or country can produce more of a good or service than any other producer with the same quantity of resources.

Comparative advantage – describes a situation in which an individual, business, or country can produce a good or service at a lower opportunity cost than another producer.



	Cars	Tractors
China	100	100
India	40	80

- China has an absolute advantage in cars and tractors because it produces more of each.
- To determine comparative advantage, redraw the table and calculate the opportunity costs for each good and for each party. The party with the lower opportunity cost has the comparative advantage for that particular good.
- According to the table below, China has the comparative advantage in cars and India has the comparative advantage in tractors.

	Cars	Tractors
China	100 cars = 100 tractors <u>1 car = 1 tractor</u>	100 tractors = 100 cars 1 tractor = 1 car
India	40 cars = 80 tractors 1 car = 2 tractors	80 tractors = 40 cars <u>1 tractor = 1/2 car</u>

Terms of trade - a ratio of one good for some quantity of another good. For example, 1 car for 3 tractors.

Mutually Beneficial Terms of Trade - terms of trade that mutually benefit both parties. For example, 1 car for 1.5 tractors will benefit both China and India because they will be able to consume a greater combination of cars and tractors than before trade. Mutually beneficial terms of trade are found between the opportunity costs for a good for each party.

Gains from trade - an increase in a producer's consumption possibilities that exceeds the producer's production possibilities. For example, given terms of trade of 1 car for 1.5 tractors, China's consumption possibilities increase from 100 cars or 100 tractors to 100 cars or 150 tractors because 100 cars for 1.5 tractors per car = 150 tractors. India's consumption possibilities increase from 40 cars or 80 tractors to 53 cars or 80 tractors because 80 tractors/1.5 tractors per car = 53 cars.

Instead of looking at how much is being produced or output, absolute and comparative advantage can also be calculated by looking at how long or how many inputs it takes to produce a single unit of a good.

	Time needed to produce a car	Time needed to produce a tractor
China	1 hour	1 hour
India	4 hours	2 hours

According to the table above, China has absolute advantages in producing both cars and tractors because they can produce them faster than India which is another way of saying they can produce more in a given time.
To determine comparative advantage, we must first calculate the opportunity cost for each country to produce cars and tractors. The table below illustrates how to think about opportunity cost when considering input or the time it takes to produce something.

	Time needed to produce a car	Time needed to produce a tractor
China	1 hour per car = 1 hour per tractor, so 1 car = 1 tractor	1 hour per tractor = 1 hour per car, so 1 tractor = 1 car
India	4 hours per car > 2 hours per tractor, so in the time it takes to make 1 car, India could have made 4/2 or 2 tractors 1 car = 2 tractors	2 hours per tractor < 4 hours per car, so in the time it takes to make 1 tractor, India could have made 2/4 or 1/2 of a car... 1 tractor = 1/2 car

So... China has a comparative advantage in cars and India has a comparative advantage in tractors

1. Define absolute advantage:
2. Define comparative advantage:

Use the table below to answer the following questions:

	Olives Per Year	Grapes Per Year
Spain	100 tons	100 tons
Italy	20 tons	80 tons

3. Which country has an absolute advantage in olives?
4. Which country has an absolute advantage in grapes?
5. Which country has a comparative advantage in olives?
6. Which country has a comparative advantage in grapes?
7. Which country should import olives? Why?
8. If terms of trade were 1 ton of olives for 2 tons of grapes would Spain be better off or worse off with trade? Why?
9. If terms of trade were 1 ton of olives for 5 tons of grapes would mutually beneficial trade occur? Why or why not?
10. If Italy doubled its productivity of both olives and grapes, would it affect Italy's comparative advantage? Why?

1. Define absolute advantage: *ability to produce more efficiently*
2. Define comparative advantage: *ability to produce at lower opportunity cost*

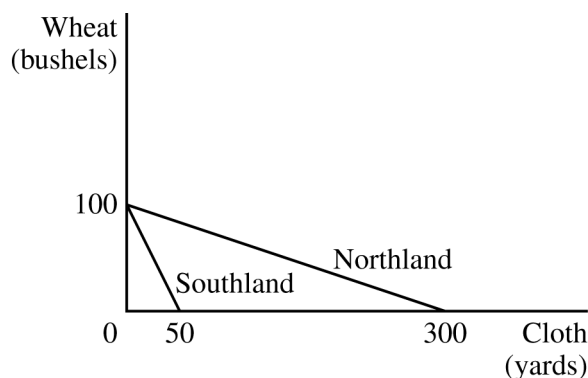
Use the table below to answer the following questions:

	Olives Per Year	Grapes Per Year
Spain	100 tons	100 tons
Italy	20 tons	80 tons

	Olives	Grapes
Spain	$100o = 100g$ $1o = 1g$	$100g = 100o$ $1g = 1o$
Italy	$20o = 80g$ $1o = 4g$	$80g = 20o$ $1g = \frac{1}{4}o$

3. Which country has an absolute advantage in olives? *Spain*
4. Which country has an absolute advantage in grapes? *Spain*
5. Which country has a comparative advantage in olives? *Spain*
6. Which country has a comparative advantage in grapes? *Italy*
7. Which country should import olives? Why? *Italy, because they will specialize in producing grapes and trade to get olives.*
8. If terms of trade were 1 ton of olives for 2 tons of grapes would Spain be better off or worse off with trade? Why? *Better off because without trade Spain only gets 1 ton of grapes for each ton of olives it gives up. They effectively gain an additional ton of grapes through trade*
9. If terms of trade were 1 ton of olives for 5 tons of grapes would mutually beneficial trade occur? Why or why not? *No, Italy would be worse off because without trade they only have to give up 4 tons of grapes to get a ton of olives.*
10. If Italy doubled its productivity of both olives and grapes, would it affect Italy's comparative advantage? Why? *No, doubling the productivity of grapes and olives would not affect the opportunity cost.*

2. The graph shows the production possibilities curves for Northland and Southland.



- (a) Which country has a comparative advantage in producing wheat? Explain using numbers.
- (b) Identify a specific number of yards of cloth that could be traded for 10 bushels of wheat and would be mutually beneficial to Northland and Southland.
- (c) Southland's maximum possible output of wheat falls from 100 bushels to 75 bushels. Assuming no other changes, will Southland have a comparative advantage in producing cloth? Explain using numbers.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

Question 2: Short**5 points**

- | | | |
|------------|---|----------------|
| (a) | State that Southland has a comparative advantage in producing wheat and explain that the opportunity cost of producing one bushel of wheat in Southland is $\frac{1}{2}$ yard of cloth, which is less than the opportunity cost of producing one bushel of wheat in Northland, which is 3 yards of cloth. | 1 point |
| (b) | Identify any specific number between 5 and 30 yards of cloth. | 1 point |
| (c) | State no and explain that Southland's opportunity cost to produce one yard of cloth is 1.5 bushels of wheat, which is greater than Northland's opportunity cost of producing cloth, which is $\frac{1}{3}$ of a bushel of wheat. | 1 point |

SUGGESTED SKILL

 *Principles and Models*

Identify an economic concept, principle, or model using quantitative data or calculations.

TOPIC 1.5

Cost-Benefit Analysis

Required Course Content

ENDURING UNDERSTANDING

CBA-1

Rational economic decisions require the evaluation of costs and benefits.

LEARNING OBJECTIVE

CBA-1.A

- Define opportunity cost.
- Explain the opportunity costs associated with choices.
- Calculate the opportunity costs associated with choices.

CBA-1.B

- Explain a decision by comparing total benefits and total costs (using a table or a graph when appropriate).
- Calculate total benefits and total costs (using a table or graph where appropriate).

ESSENTIAL KNOWLEDGE

CBA-1.A.1

Rational agents consider opportunity costs, whether implicit or explicit, when calculating the total economic costs of any decision.

CBA-1.A.2

Total benefits form the metric “utility” for consumers and total revenue for firms.

CBA-1.B.1

Total net benefits, the difference between total benefits and total costs, are maximized at the optimal choice.

CBA-1.B.2

Some decisions permit rational agents to look at only marginal benefit and marginal cost. Other decisions cannot be broken down into increments in this way and must be evaluated by looking at total benefits and total costs.

TOPIC 1.6

Marginal Analysis and Consumer Choice

SUGGESTED SKILL

 Interpretation

2.C

Interpret a specific economic outcome using quantitative data or calculations.



AVAILABLE RESOURCE

- Classroom Resources
 - > [Mastering Economic Thinking Skills—Focusing on Marginal Thinking and Game Theory in Microeconomics](#)

Required Course Content

ENDURING UNDERSTANDING

CBA-2

To determine the optimal level at which to pursue an activity whose total benefits exceed total cost, rational economic agents compare marginal benefits and marginal costs.

LEARNING OBJECTIVE

CBA-2.A

- Define the key assumptions of consumer choice theory.
- Explain (using a table or graph as appropriate) how a rational consumer's decision making involves the use of marginal benefits and marginal costs.
- Calculate (using a table or a graph when appropriate) how a rational consumer's decision making involves the use of marginal benefits and marginal costs.

ESSENTIAL KNOWLEDGE

CBA-2.A.1

Consumers face constraints and have to make optimal decisions accounting for these constraints.

CBA-2.A.2

In a model of rational consumer choice, consumers are assumed to make choices so as to maximize their total utility.

CBA-2.A.3

Consumers experience diminishing marginal utility in the consumption of goods and services.

CBA-2.A.4

Consumers allocate their limited income to purchase the combination of goods that maximizes their utility by equating/comparing the marginal utility of the last dollar spent on each good.

X Exclusion:

Indifference curves are beyond the scope of the course and the AP Exam, but equating the ratios of marginal utility to price is within the scope.

continued on next page

LEARNING OBJECTIVE**CBA-2.B**

- a. Define marginal analysis and related terms.
- b. Explain a decision using marginal analysis (using a table or a graph when appropriate).

ESSENTIAL KNOWLEDGE**CBA-2.B.1**

Marginal analysis involves comparing the additional benefit of increasing a given activity with the additional cost. Comparing marginal benefit (MB) with marginal cost (MC) helps individuals (firms) decide whether to increase, decrease, or maintain their consumption (production) levels.

CBA-2.B.2

The optimal quantity at any point in time does not depend on fixed costs (sunk costs) or fixed benefits that have already been determined by past choices.

CBA-2.B.3

The optimal quantity is achieved when marginal benefit is equal to marginal cost or where total benefit is maximized.

A. Marginal Benefit

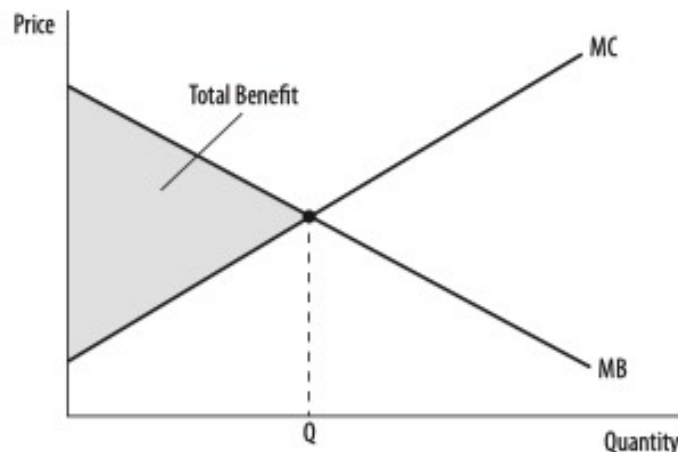
1. Marginal benefit (MB) is the extra benefit gained from consuming an additional good or service.
2. Economists assume that people try to maximize their benefit.
3. Each additional unit of a good or service that people consume gives them less benefit than the previous unit. For example, your first chocolate chip cookie gives you more benefit than your second chocolate chip cookie.

B. Marginal Cost

1. Marginal cost (MC) is the extra cost of producing an additional good or service
2. Economists assume that people try to minimize their cost.
3. Each additional unit of a good or service that people produce costs more than the previous unit because of the law of increasing opportunity cost. For example, people must give up more to produce two woven blankets than to produce one.

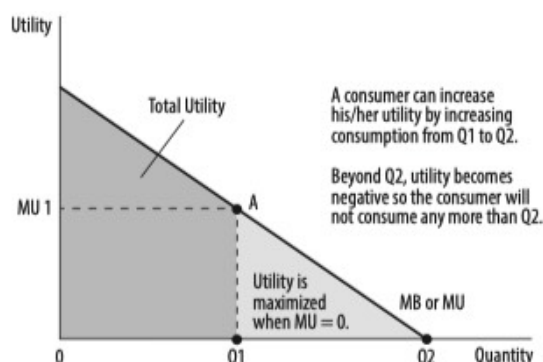
C. Allocative Efficiency

1. Allocative efficiency happens when the amount of a good or service produced is most beneficial to society. In other words, it is the level of output associated with maximizing society's total benefit.
2. Allocative efficiency happens at the point where $MB = MC$.
3. If $MB > MC$, then total benefit can be increased by consuming or producing more output.
4. If $MB < MC$, then total benefit can be increased by consuming or producing less output.
5. The graph below shows allocative efficiency at Q.

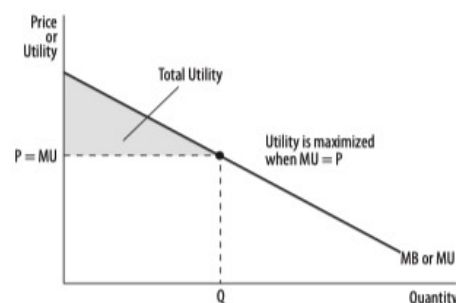
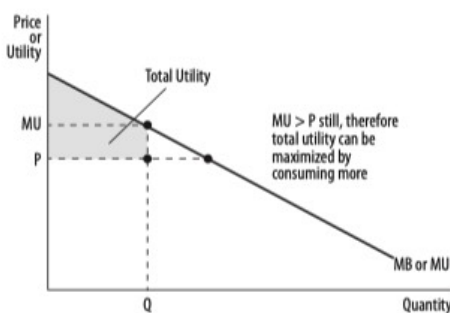
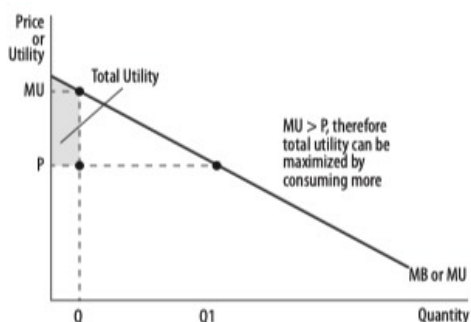


A. Utility Maximization

1. Recall that utility is the benefit or satisfaction consumers receive from consuming a good or service.
2. One assumption that economists make about people is that they try to benefit themselves as much as possible or maximize their total satisfaction. Economists call this behavior utility maximization.
3. Every time a person consumes an extra unit of a good they experience marginal utility, or extra satisfaction.
4. Marginal utility diminishes as consumption increases.



5. When consumers have to pay for a good or service at the market-equilibrium price, they will consume up until the point where the marginal utility of their purchase equals the price of their purchase.



B. The Utility-Maximizing Rule

1. How do people decide how much to consume when they are faced with multiple goods and a limited budget? Economists use the utility maximizing rule to illustrate how consumers make this choice.
2. The utility maximizing rule says that a consumer's utility is maximized when the last dollar spent on each of the goods purchased yields the same marginal utility. So, take the marginal utility of good x divided by the price of good x and check to see if it equals the marginal utility of good y divided by the price of good y.

Utility is maximized when $MU_x / P_x = MU_y / P_y$ OR $MU_x / MU_y = P_x / P_y$

1. Define the following:

Benefit
Explicit Cost
Implicit Cost
Net Benefit
Opportunity Cost
Utility

2. A recent college graduate has three job offers. After ranking the job offers according to salary, healthcare coverage, retirement, plan, company culture, and location, which is the best description of the graduate's opportunity cost when accepting the offer from their highest ranked company?

- a. The opportunity cost of accepting their highest ranked offer is the combined benefits they do not receive had they accepting the other two offers
- b. The opportunity cost of accepting their highest ranked offer is the benefit they do not receive had they accepted the next best alternative offer
- c. There is no opportunity cost accepting a job offer

3. Use the following table to calculate the total net benefit of completing an undergraduate degree. Assume, the prospective student plans to quit their current full-time job earning \$40,000 per year and attend college full-time for 4 years while working part time. Also assume that the student will use their accumulated savings in addition to their income from their part-time work to pay for the degree . Further assume the student can reasonably expect to get a job earning the average starting salary for their chosen degree. At the end of their first year on the job after having completed their degree, calculate the graduate's net benefit.

Benefit	Cost
\$80,000 starting salary after graduating	\$50,000 tuition and fees/year
\$20,000 in employee benefits per year	Foregone income from working part-time rather than full-time.

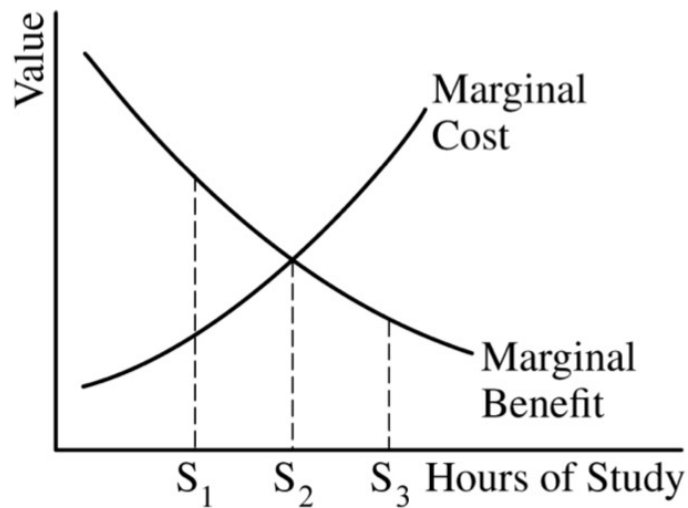
Net Benefit = Total Benefit - Total Cost =

4. Using the data from the table above, how many years will the student have to work at their starting salary in order to break-even?

5. Which of the following statements do you like better? Explain why.

"Follow your dreams, no matter the cost!"

"Always count the cost of your decisions."



2. The graph above shows the marginal benefit that a student receives and the marginal cost the student incurs from additional hours of study. Which of the following is true?
- (A) Beyond S_2 hours of study, there is no further benefit from devoting additional hours to study.
 - (B) At S_1 hours of study, the extra marginal cost of study time exceeds the extra marginal benefit of study time.
 - (C) The optimal number of hours that the student should study is S_2 hours.
 - (D) The rational individual should study S_3 hours.
 - (E) The marginal cost of studying decreases as more time is spent studying.

3. The table below shows the total cost and total benefit of advertisements placed by AZY Foods, a firm in the retail food market.

Number of Advertisements	Total Cost (\$)	Total Benefit (\$)
1	300	1,200
2	500	2,200
3	800	3,000
4	1,300	3,600
5	2,100	4,000
6	3,000	4,200
7	4,100	4,200

- (a) Calculate the total net benefit of placing three advertisements. Show your work.
- (b) Calculate the marginal net benefit of the third advertisement. Show your work.
- (c) What is the optimal number of advertisements placed by AZY Foods? Explain using marginal analysis.
- (d) Suppose over the next year the marginal benefit that AZY Foods receives from each advertisement increases by \$300. Identify the optimal number of advertisements.

Begin your response to this question at the top of a new page in the separate Free Response booklet and fill in the appropriate circle at the top of each page to indicate the question number.

Question 3: Short**5 points**

-
- (a) Calculate the total net benefit of placing three advertisements as \$2,200 and show your work: 1 point

$$\text{Total net benefit} = \$3,000 - \$800 = \$2,200$$

-
- (b) Calculate the marginal net benefit of the third advertisement as \$500 and show your work: 1 point

$$\text{Marginal net benefit} = (\$3,000 - \$2,200) - (\$800 - \$500) = \$800 - \$300 = \$500$$

-
- (c) Identify the optimal number of advertisements as 4 and explain that the marginal net benefit of the 4th advertisement is positive ($\$600 - \$500 = \$100$), but the marginal net benefit of the 5th advertisement is negative ($\$400 - \$800 = -\$400$). 1 point

-
- (d) Identify the optimal number of advertisements as 4. 1 point
-