As you work toward achieving that 5 on your AP Macroeconomics exam, here are five essentials that you **MUST** know above everything else:

Barron's 5 Essential

1. **Understand the aggregate supply/aggregate demand model.** This concept is critical for doing well on the exam. It is likely to appear on a free-response question and will be used to answer multiple-choice questions.
   - As with any diagram, be able to label all axes and curves.
   - You should know what can shift the aggregate supply and aggregate demand curves.
   - You should be able to use the model to conclude what will happen in the long run and in the short run when one or both of the curves shifts.

2. **Vocabulary is important.** Very few, if any, of the questions on the AP exam will ask you to define a specific term but you need to know the definition of technical ones.
   - For instance, a multiple-choice question may ask about closing an inflationary gap. You will be at a total loss if the term "inflationary gap" is not in your vocabulary.
   - Be sure you know the terms listed at the end of each chapter.

3. **Monetary and fiscal policy are critical concepts.** One of the most important things a student learns in introductory macroeconomics is that monetary and fiscal policy can be used to help fight unemployment and inflation.
   - Be able to demonstrate how monetary and fiscal policy work on an aggregate supply/aggregate demand diagram.
   - There are several reasons why monetary and fiscal policy may not work. You should be able to list and explain these reasons.
   - Monetary and fiscal policy are not as effective in economies that rely heavily on international trade and have flexible exchange rates. You should be able to explain why.

4. **Diagrams are more important than formulas.** Important formulas are listed at the end of each chapter. However, calculators are not allowed on the exam, so complex calculations will not be required.
   - Easy formulas such as Fisher's hypothesis or the formula for the unemployment rate are more likely to come into play on the exam.
   - Specific diagrams, such as the supply and demand for loanable funds, are often required. Be sure to label all axes and curves. If you forget a label, use something general like "Q" for quantity or "D" for demand.

5. **Be definite in your conclusions to free-response questions.** Some questions are complex and have different conclusions in different circumstances. Nevertheless, be definite in your response.
   - If you use the wrong approach on a free-response question but your conclusion is correct, you will still earn points. State your conclusion clearly.
   - You can earn points on a free-response question just for having the appropriate graph correctly labeled. To obtain full credit, explain what is happening on the graph and reach the correct conclusion.

The National Economic Accounts

12

- → GROSS DOMESTIC PRODUCT (GDP)
- → REAL GDP
- → THE UNDERGROUND ECONOMY
- → GROSS NATIONAL PRODUCT (GNP)
- → NATIONAL INCOME
- → PERSONAL INCOME

You can access an additional practice test for Macroeconomics at *www.barronsbooks.com/ap/ap-economics/*.

THE ACCOUNTS

The National Economic Accounts (NEA) make up a comprehensive group of statistics that measure various aspects of the economy's performance. For instance, if everyone's income in the United States was summed together, how much would that be? The figure for personal income in 2016 was $16,011.6 billion. What were corporate profits in 2016? $2,195.3 billion. Personal income and corporate profits are two examples of the hundreds of statistics included in the NEA.

The NEA includes a variety of measures of income and production. The most recent updates on these figures are published by the Department of Commerce in a periodical titled the "Survey of Current Business." On the Internet, updates are available at *www.bea.gov*, the home page of the Bureau of Economic Analysis (BEA), an agency within the Department of Commerce.

GROSS DOMESTIC PRODUCT

The premier statistic for measuring the overall performance of the economy is gross domestic product (GDP). GDP measures the dollar value of production within the nation's borders. Generally speaking, the more that is produced, the healthier the economy.

The BEA provides "flash" estimates of GDP for each quarter about 30 days after the quarter ends, but these rough estimates are subject to large revisions. The annual estimates of GDP are more reliable, but they, too, are subject to revision.

An amazing feature of these estimates is that they are available on such a timely basis. Consider all of the goods and services produced in the United States in a year, from toothpicks and cellular phones to haircuts and surgery. How does the BEA keep track of all this production? For 2016, GDP was estimated to be $18,569.1 billion.

How did the BEA arrive at this figure? A small army of statisticians and analysts keeps track of production and sales of a wide variety of goods and services. For instance, one person is responsible for Popsicle sticks, toothpicks, and tongue depressors. This person gets in touch

with the major suppliers and retailers of these products. From this survey an estimate of the number of toothpicks sold is obtained. There is a difference between the number of toothpicks sold and the number produced, but this difference will be allowed for later. The survey of manufacturers and retailers also yields an average price of toothpicks. Then the number of toothpicks sold is multiplied by their price to get the dollar value of toothpick sales.

The dollar values of all other products sold are added to the figure for toothpicks to obtain an estimate of total sales of goods and services. The resulting figure is known as "final sales" and is part of the NEA. But it is not GDP. GDP measures *production*, not sales. There may be goods that are produced but not sold. They will show up in inventories at the manufacturers or at the retailers. Therefore, the change in business inventories is added to final sales to arrive at GDP.

Table 12.1 shows the calculation of GDP for a hypothetical economy that produces only two products—pizza and soda. In the year 2012, four pizzas are produced at an average retail price of $10; 12 sodas are produced at a price of $2. GDP is $64. In the year 2013, pizza production is up to five pizzas and the price has increased to $11. Soda production is up to 15 units, but the price has fallen to $1. GDP is $70.

Table 12.1 Calculating GDP

Year 2012		
Production	**Price**	**Value**
4 Pizzas	$10	$40
12 Sodas	$2	$24
		GDP = $64
Year 2013		
Production	**Price**	**Value**
5 Pizzas	$11	$55
15 Sodas	$1	$15
		GDP = $70

This is a general overview of how GDP is estimated. In practice, many more complications arise. Some of these complications will come to light as we examine the expenditure and the income approaches to calculating GDP.

THE EXPENDITURES APPROACH

Consumption Expenditures

If you look up the estimates of GDP online, don't expect to see the dollar value of toothpicks sold or produced. That level of detail would require a publication much thicker than the *Oxford English Dictionary*. Instead, the BEA lumps together all the goods and services sold to households and calls this consumption expenditures.

Government Expenditures

However, state, local, and federal governments also make expenditures. The things that are produced and sold to governments are summed together and referred to as government expenditures. Some of the products that governments buy are unique to this category. For instance, fighter jets are sold to our federal government but not to individual households. On

the other hand, our government purchases many of the same items bought by households, such as personal computers; but the value of personal computers purchased by the government will be different than that of households.

Investment Expenditures

Expenditures by businesses on plant and equipment are called investment expenditures; thus, the term "investment" means something very different in its economic sense. It does not refer to households buying stocks or bonds. The complete definition of investment is business expenditures on plant and equipment plus residential construction plus the change in business inventories. The change in business inventories was mentioned in the previous section. It changes the figure for final sales into GDP. The BEA lumps the change in inventories in with business spending on plant and equipment and residential construction to get what it calls investment.

Exports and Imports

Many goods and services are produced here and sold abroad. These are called exports. Some of the expenditures made by households, government, and businesses will be on goods and services from abroad. These imports should not be included in our GDP since they represent production outside our nation's borders. That is why imports are subtracted from exports to get "net exports."

GDP represents production. Some of the goods and services produced go to households, some go to government, some go to businesses, and some are sold abroad. Imports are subtracted out because these products were not made domestically, yet they are counted in consumption expenditures by households, purchases by government, and investment by firms.

The expenditure approach to calculating GDP is often summarized with the formula:

$$GDP = C + I + G + X$$

where C is consumption expenditures by households
I is investment by firms
G is government purchases
X is net exports = exports – imports

The formula appears deceptively simple. Remember that to obtain the figure for C, consumption expenditures, quite a bit of effort is required. The average price and quantity sold of millions of products must be gathered. The same must be done for I, G, and X.

Table 12.2 shows the components of the expenditure approach to calculating GDP with their values for 2016. Notice that about 70 percent of all the goods and services produced go to households.

Table 12.2 The Expenditure Approach to GDP—2016

	(Billions of Dollars)
Consumption expenditures	12,757.9
Government expenditures	3,276.7
Investment	3,035.7
Net exports	-501.2
GDP	18,569.1

Source: U.S. Department of Commerce, Bureau of Economic Analysis

THE INCOME APPROACH

The BEA takes the trouble to calculate GDP in a manner completely different from the expenditure approach outlined above. This second way of calculating GDP is known as the income approach. The income approach yields several statistics that are incorporated into the NEA and provides a check on the expenditure approach.

Theoretically, both techniques for calculating GDP will result in exactly the same figure because when anything is produced, whether it is a stick of gum or a skyscraper, just enough income is generated in the production process to equal the value of what is produced.

Consider a toaster that retails for $15. Suppose it costs $10 to manufacture:

Labor	$6
Materials	$3
Overhead	$1

Since the toaster retails for $15, then $5 in profits were made when it was sold. So, if everyone who had anything to do with the manufacture of the toaster chipped in the income they made, it would equal $15 exactly. Workers made $6; raw material owners made $3; the utility company (overhead) made $1; and the owner of the toaster company made $5. Altogether, this comes to $15.

Notice that if the toaster sold for $15.01, then $5.01 in profits would have been earned and the principle would still hold true: whenever anything is produced, just enough is earned to buy it back. Therefore, an alternate way to measure GDP, which measures production, would be to add up all the income that was earned in the economy. That is the income approach to calculating GDP.

Table 12.3 outlines the income approach for calculating GDP. Wages and salaries are the predominant type of income. But there is also proprietors' income, rental income, and interest income. Corporate profits must also be included because this represents corporate income and corporations are owned by their shareholders. There are some adjustments that must be made once all the types of income are summed together. Specifically, indirect business taxes (such as business licenses) and depreciation must be added in.

Table 12.3 The Income Approach to GDP—2016

	(Billions of Dollars)
Compensation of employees	10,101.3
Proprietors' income	1,417.5
Rental income	704.7
Interest income	485.3
Corporate profits	2,085.8
Taxes on production and imports	1,197.0
Net business transfer payments	161.2
Government enterprise surplus	-22.4
Depreciation	264.9
Statistical discrepancy	+2,703.6
GDP	18,569.1

Source: U.S. Department of Commerce, Bureau of Economic Analysis

ADJUSTING FOR PRICE CHANGES

GDP measures production, but one cannot conclude that more was produced simply because this year's GDP was greater than last because prices may have risen. The rise in prices could offset a decline in production volume, resulting in a higher figure for GDP. Clearly, if the prices of the goods and services produced changes, so will GDP, regardless of production.

There is, however, a simple way to correct for price changes: When calculating GDP for different years, use prices from just one of those years. This way the prices are constant from one year to the next and any change in GDP must be due to a change in production.

The BEA routinely makes this correction and the resulting figure is known as "real GDP," or "constant-dollar GDP." In order to make the distinction, regular GDP is sometimes referred to as "nominal" or "current-dollar GDP." The year from which prices are taken to calculate real GDP is called the base year. It does not matter which year is chosen as the base year. The important feature is that prices are held constant, so that any changes in real GDP are the result of changes in the amount of production.

Table 12.4 shows nominal and real GDP over the years. An astute reader could deduce that 2009 is the base year since real and nominal GDP are equivalent in that year. Once nominal and real GDP have been calculated, it is a simple matter to obtain a measure of price changes. But this statistic will be discussed in the next chapter when inflation and price indexes are taken up.

TIP

Any economic statistic with the term "real" inserted in front of it means that statistic has been adjusted for inflation, i.e., real interest rate, real consumer spending.

Table 12.4 Nominal and Real GDP

	Nominal GDP (billions of $)	Real GDP (billions of chained 2009 $)
2006	13,855.9	14,613.8
2007	14,477.6	14,873.7
2008	14,718.6	14,830.4
2009	14,418.7	14,418.7
2010	14,964.4	14,783.8
2011	15,517.9	15,020.6
2012	16,155.3	15,354.6
2013	16,691.5	15,612.2
2014	17,393.1	15,982.3
2015	18,036.6	16,397.2
2016	18,569.1	16,662.1

Source: U.S. Department of Commerce, Bureau of Economic Analysis

THE UNDERGROUND ECONOMY

Each year there are trillions of dollars of goods and services that are produced and never counted in GDP. All of this production falls into what is called the underground economy. The first thing that comes to mind with regard to the underground economy is illegal items and activities, but illegal production and ill-gotten income are the smaller part of the underground economy.

Marry your auto mechanic, the saying goes, and you will lower GDP. This is true because when you took your car to the shop to be repaired, the BEA was able to estimate the transaction and include it in GDP under household consumption. Now that the mechanic is your

spouse, the auto repairs are done out back under the shade tree. The BEA does not attempt to measure this sort of production.

Anything households do for themselves and that does not pass through a market goes unmeasured. This amounts to quite a bit of production—the backyard gardens, the lawn maintenance, the cleaning, the babysitting, etc. One estimate of underground household production puts it at 30 percent of official GDP.

Illegal gambling services, prostitution, and drugs are not counted in official GDP estimates. The housepainter who insists on being paid in cash to avoid taxes is part of the underground economy.

By adding together the legal and illegal sides of the underground economy, some analysts get a figure that is 150 percent of the official figure. That implies that production in the United States in 2016 was closer to $28,000.0 billion than the official figure of $18,569.1 billion.

OTHER THINGS NOT COUNTED IN GDP

The underground economy is a subset of total production that is not counted in GDP but, technically speaking, should be. The illegal nature of the goods and services involved often prohibits estimation. However, there is a list of things that are not counted in GDP and rightly so.

1. For instance, it would be incorrect to count **secondhand sales** in GDP. When you sell your 1997 Ford truck, this does not represent production in the current year. The truck was counted in the GDP of 1997 and there is no reason to count it, or any portion of it, again simply because it is being resold.
2. **Transactions that are purely financial** are not, and should not be, counted in GDP. If you buy 100 shares of IBM stock, this does not directly represent any new production. Someone got your money and you got their shares of IBM. This swap does not affect GDP except for any brokerage services provided.
3. **Intermediate sales** are not included in GDP. These are sales to firms that will incorporate the item into their final product. An example will help here. When a corporation that makes Popsicles buys Popsicle sticks, this is an intermediate sale. When a person buys a Popsicle, he cannot avoid buying the stick as well. This latter transaction is counted in GDP and valued at the price of the Popsicle and the stick. So the stick would be counted twice if the purchase of sticks by the manufacturer was included in GDP and the final sale to the consumer was also counted.

   As another example of an intermediate transaction, the purchase of flour by a baker is not counted in GDP because the flour will get counted when the bread is purchased by a household. However, when a baker buys a delivery truck, this is not an intermediate transaction and the purchase gets counted in GDP under investment expenditures.

OTHER MEASURES IN THE NATIONAL ECONOMIC ACCOUNTS

Table 12.5 highlights several other important measures in the NEA aside from GDP. Again, GDP measures overall production, and therefore income as well, in the economy. Gross national product is similar to GDP except GNP includes production by American workers abroad and excludes production by foreign workers in America.

Table 12.5 GDP and Other Measures in NEA—2016

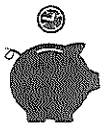
	(Billions of Dollars)
Gross Domestic Product (GDP)	18,569.1
Gross National Product (GNP)	18,776.0
National Income (NI)	16,130.4
Personal Income (PI)	16,011.6
Disposable Personal Income (DPI)	14,045.9

Source: U.S. Department of Commerce, Bureau of Economic Analysis

Another figure, national income (NI), measures the income earned by households and profits earned by firms after adjusting for depreciation and indirect business taxes. NI is often defined as the income earned by all the factors of production. The factors of production are land, labor, and capital.

NI represents the income earned by households and firms, but personal income (PI) represents the income received by households only.

Finally, disposable personal income (DPI) is the income of households after taxes have been paid. It is easily derived by subtracting personal taxes from PI. Disposable income represents the discretionary income of households. It can be spent or saved.



SUMMARY

- The NEA are a bank of internally consistent statistics that measure various aspects of the economy's performance. Basically, the NEA measure production and income in their various forms. An implicit assumption behind the statistics is that more production and more income means a better economy.
- Some economists have questioned this assumption. Are we really better off when we produce more gadgets and gizmos, and pollute the environment in the process? Is it possible for more to be produced and more income to be earned while the quality of life deteriorates? Another criticism of the NEA concerns leisure time. Don't rising production levels sometimes result in less leisure time? If so, this is not reflected in the statistics where the negative side effects of increased production levels are not taken into account.
- Despite these criticisms, the NEA are the best measures available for gauging the economy's health. **One final note:** Other nations have similar statistics, but they may not be defined or collected in the same way. There are, however, some organizations that generate and publish international data that are comparable across countries. Putting the statistics on a per capita basis also facilitates international comparisons.

Table 12.6 GDP and GDP per Capita for Selected Countries, 2016

Country	GDP (billions of $)	GDP per Capita ($ per person)
Canada	1,674	46,200
China	21,140	14,600
Japan	4,932	38,900
Switzerland	494.3	59,400
United Kingdom	2,788	42,500
United States	18,569	57,300

Source: World Fact Book, CIA

TERMS

Consumption Expenditures the dollar value of all the goods and services sold to households

Disposable Personal Income (DPI) the income of households after taxes have been paid

Government Expenditures the dollar value of goods and services sold to governments

Gross Domestic Product (GDP) dollar value of production within a nation's borders

Gross National Product (GNP) dollar value of production by a country's citizens

Intermediate Sales sales to firms that will incorporate the item into their final product

Investment Expenditures expenditures by businesses on plant and equipment plus residential construction and the change in business inventories

National Economic Accounts (NEA) a comprehensive group of statistics that measures various aspects of the economy's performance

National Income (NI) the income earned by households and profits earned by firms after subtracting depreciation and indirect business taxes

Net Exports exports minus imports

Personal Income (PI) income received by households

Real GDP GDP adjusted for price changes

Underground Economy all the illegal production of goods and services and legal production that does not pass through markets

FORMULAS

$$GDP = C + I + G + X$$

$$\text{GDP per Capita} = \frac{\text{GDP}}{\text{Population}}$$

MULTIPLE-CHOICE REVIEW QUESTIONS

1. GDP is calculated for each _____ by _____.
   (A) quarter; the Bureau of Economic Analysis
   (B) week; the Bureau of Economic Analysis
   (C) month; the Bureau of Economic Analysis
   (D) month; the Bureau of Labor Statistics
   (E) quarter; the Bureau of Labor Statistics

2. "Flash" estimates of GDP
   (A) are subject to revision.
   (B) do not require revision.
   (C) are available after a thirty-day lag.
   (D) both (A) and (C)
   (E) both (B) and (C)

3. According to the way in which economists use the word, the bulk of "investment" is done by
   (A) households.
   (B) businesses.
   (C) government.
   (D) foreigners.
   (E) all of the above.

4. In the equation GDP = C + I + G + X, X stands for
   (A) exports.
   (B) expenditures.
   (C) exports minus imports.
   (D) imports minus exports.
   (E) export taxes.

5. GDP measures
   (A) production within a nation's borders.
   (B) production by a nation's citizens wherever they may be.
   (C) income earned by the factors of production plus depreciation and indirect business taxes.
   (D) (B) and (C)
   (E) (A) and (C)

6. Suppose a nation produces only two goods: pizza and soda. In 2018 20 pizzas are sold at $10 each and 10 sodas are sold at $1 each. In 2016, the base year, 10 pizzas were sold at $8 each and 10 sodas were sold at $1 each. Therefore, nominal GDP in 2018 is _____ and real GDP in 2018 is _____.
   (A) 30; 20
   (B) $170; $90
   (C) $210; $100
   (D) $110; $90
   (E) $210; $170

7. Imagine an economy that produces only two goods: cheese and crackers. Calculate GDP for this economy if cheese retails for $3 a pound and 10 pounds are produced while crackers sell for $2 a pound and 20 pounds are produced.
   (A) $35
   (B) $1,200
   (C) $70
   (D) $150
   (E) Not enough information is given to calculate GDP.

8. Assume Country Z only produces hot dogs and buns. Given the table below, what is the value of GDP in Country Z?

Production	*Price*
4 hot dogs	$1.00
4 buns	$0.50

   (A) $1.50
   (B) $12.00
   (C) $6.00
   (D) $8.00
   (E) $4.50

9. If XYZ Corporation buys an original Matisse painting to hang in its board room, then
   (A) GDP decreases by the amount of the purchase because C decreases.
   (B) GDP increases by the amount of the purchase because I increases.
   (C) GDP is unaffected because it is a second-hand sale.
   (D) GDP decreases because I decreases.
   (E) I increases, but C decreases.

10. The cabbages you grow in your summer garden are
   (A) counted in GDP under C.
   (B) counted in GDP under I.
   (C) counted in GDP but not NDP.
   (D) not counted in GDP.
   (E) counted in final sales but not GDP.

11. If your grandparents have a new home built for their retirement, this would primarily affect
   (A) consumption.
   (B) government purchases.
   (C) investment.
   (D) exports.
   (E) imports.

12. GDP measures
   I. production
   II. income earned during the production process
   III. spending by consumers, businesses, governments, and foreigners
   (A) Only I is correct.
   (B) Only II is correct.
   (C) Only III is correct.
   (D) Only I and II are correct.
   (E) I, II, and III are correct.

13. Given:

Government expenditures	$300
Depreciation	$200
Investment	$400
Consumption expenditures	$900
Taxes	$100
Corporate profits	$500
Exports	$200
Imports	$300

GDP equals _____.
   (A) $1,800
   (B) $2,900
   (C) $1,500
   (D) $1,700
   (E) $2,100

14. Which of the following events has no effect on GDP?
   (A) You buy a 1957 Chevy from a friend.
   (B) The Department of Transportation repaves a road.
   (C) Your friends make a music CD that doesn't sell any copies.
   (D) A college buys computers.
   (E) You buy a bottle of French wine.

15. Which of the following will have an effect on GDP?
   (A) You lose $50 betting with a friend.
   (B) You fix your brother's car without buying any new parts.
   (C) Your father's firm makes computers and exports them to China.
   (D) You buy 1,000 shares of stock in a corporation.
   (E) Your wealthy uncle buys a painting by Picasso.

FREE-RESPONSE REVIEW QUESTIONS

1. Explain the difference between nominal GDP, real GDP, and GDP per capita.

2. Suppose that production and prices rise from one year to the next, but population stays constant. Will each of the three statistics above rise, fall, or remain unchanged? Explain your reasoning.

3. In what type of situation is GDP per capita more appropriate than nominal or real GDP?

4. Is GDP an under- or overestimate? Explain.

Multiple-Choice Review Answers

1. **(A)**	5. **(E)**	9. **(C)**	13. **(C)**
2. **(D)**	6. **(E)**	10. **(D)**	14. **(A)**
3. **(B)**	7. **(C)**	11. **(C)**	15. **(C)**
4. **(C)**	8. **(C)**	12. **(E)**	

Free-Response Review Answers

1. Nominal GDP measures the production of goods and services within a nation's borders. Nominal GDP could increase because of an increase in output or an increase in the prices of the goods and services produced. Real GDP measures production, but adjusts for any price changes. Real GDP does not change if prices change because it values current output in terms of prices of the given base period. Only one thing can cause real GDP to change and that is a change in output. GDP per capita is production per person.

2. If production and prices rise while population stays constant, then all three statistics—GDP, real GDP, and GDP per capita—will rise. GDP rises if production or prices rise. Real GDP rises if production rises. Per capita GDP rises if GDP rises and population does not.

3. GDP per capita is most appropriate for making international comparisons of GDP. The GDP of the United States is much greater than that of Switzerland, but production per person, and therefore living standards, are not all that different between the two nations.

4. GDP is a vast underestimate of output because of all the production that is not counted. Items that do not go through standard markets are not counted. This includes illegal drugs and gambling, but also home car repair and household vegetable gardens. All of this uncounted production is known as the underground economy. Estimates are that the underground economy could be half the size of the official economy.