ECON 010 - Principles of Macroeconomics
Drake University, Spring 2026
William M. Boal

Signature: _____

Printed name: _____

FINAL EXAMINATION VERSION A

INSTRUCTIONS: This exam is closed-book, closed-notes. Simple calculators are permitted, but graphing calculators, calculators with alphabetical keyboards, cell phones, and wireless devices are NOT permitted. Numerical answers, if rounded, must be correct to at least 3 significant digits. Point values for each question are noted in brackets. Maximum total points are 200.

I. Multiple choice: Please circle the one best answer to each question. [1 pt each, 22 pts total]

(1) "The unemployment rate is 20 percent" is an example of
a. a positive statement.
b. a normative statement.
c. both of the above.
d. none of the above.

(2) A *production function* shows the relationship between the
a. level of output and the level of demand for output.
b. price of output and the quantity produced.
c. quantity of input and the quantity of output.
d. current level of output and the past level of output.

(3) Barter is an unpopular method of trading because it
a. is often illegal.
b. causes both parties to lose.
c. is subject to higher taxes.
d. requires that each party be able to offer a good that the other wants.
e. all of the above.

(4) Some people believe there is excess supply in the market for computers. If they are right, then the price of computers can be expected to
a. rise.
b. fall.
c. remain constant.
d. Price movements are not related to excess supply.

(5) Which of the following shows a strong upward trend for the U.S. over the last century?
a. The inflation rate.
b. The interest rate.
c. The unemployment rate.
d. Real GDP per capita.

(6) Taxes and government spending are components of
a. monetary policy.
b. international trade policy.
c. fiscal policy.
d. foreign policy.

(7) Government purchases in the national accounts do *not* include
a. spending on highway construction.
b. salaries of police and fire personnel.
c. pay for members of the armed services.
d. spending for unemployment benefits.
e. spending for environmental preservation.

(8) If a country's national savings (S) exceed its investment spending (I), then the country must have
a. a trade deficit.
b. a trade surplus.
c. zero net exports.
d. cannot be determined from information given.

(9) According to the aggregate production function, potential GDP is determined by all of the following except
a. stimulus spending
b. technology.
c. the size of the labor force.
d. the size of the capital stock.
e. None of the above determine potential GDP.

(10) The industrial revolution, which began in Britain, was accompanied by a dramatic increase in
a. labor input.
b. land input.
c. capital input.

(11) Unemployment caused by a mismatch of worker skills to jobs, or insufficient work incentives, is called
a. structural unemployment.
b. frictional unemployment
c. cyclical unemployment.
d. all of the above.

(12) Hyperinflation is caused by excessive
a. government spending.
b. growth of the money supply.
c. consumption spending.
d. taxes.
e. government borrowing.

(13) Most economists believe that business cycles are usually caused by fluctuations in
a. aggregate demand.
b. the population.
c. aggregate supply (that is, potential GDP).
d. the labor force.
e. the capital stock.

(14) According to Keynes, an increase in government purchases causes a further increase in
a. consumption.
b. investment.
c. net exports.
d. the money supply.
e. the inflation rate.

(15) A "price shock" is a rise in inflation
a. that is deliberately intended to get the economy moving again.
b. that is invisible to consumers.
c. that voters disapprove of.
d. that is unrelated to the output gap.

(16) "Quantitative easing" means
a. adjusting numbers to fit the problem at hand.
b. massive purchases of bonds by the central bank.
c. gradual implementation of fiscal policy so as not to disturb markets.
d. lowering interest rates.

(17) Suppose at the end of last year, the federal debt were $30 trillion. Suppose this year the government ran a budget *deficit* of $1 trillion. Then at the end of this year, the federal debt would be
a. $1 trillion.
b. $29 trillion.
c. $30 trillion.
d. $31 trillion.
e. Cannot be determined.

(18) If the federal budget is initially in deficit and a recession occurs, then that deficit will
a. increase.
b. remain constant.
c. decrease or maybe become a surplus.
d. cannot be determined from information given.

(19) Suppose the deficit is reduced by quickly increasing taxes or decreasing spending. This may, in the short run, cause
a. a decrease in the money supply.
b. hyperinflation.
c. a price bubble.
d. a boom.
e. a recession.
f. a price shock.

(20) Who sets monetary policy in the United States?
a. The Secretary of the Treasury.
b. The Federal Deposit Insurance Corporation.
c. The President.
d. The Senate Banking Committee.
e. The Federal Reserve Board of Governors.
f. The Federal Reserve District Banks.
g. The Federal Open Market Committee.

(21) A central bank that engages in countercyclical monetary policy lowers interest rates when
a. unemployment is less than the natural rate.
b. GDP is less than potential GDP.
c. imports are less than exports.
d. government spending is less than tax revenue.

(22) Countries tend to have lower inflation rates in the long run if the heads of their central banks are
a. more independent of elected officials.
b. directly elected by the people—who after all must live with the consequences of central bank policies.
c. under the direct control of elected officials and can be fired at any time.
d. cannot be determined from information given.

II. Problems: Insert your answer to each question in the box provided. Use margins and graphs for scratch work. Only the answers in the boxes will be graded. Work carefully—partial credit is not normally given for questions in this section.

(1) [Economic capital: 6 pts] Which of the following are examples of *economic capital* ? Answer YES or NO.

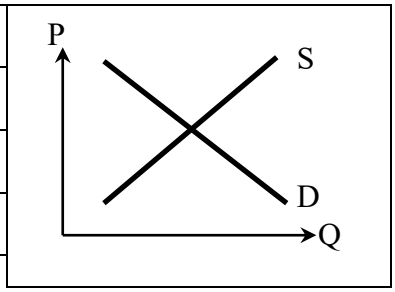
a. Bulldozers.		d. Data centers.	
b. Corporate bonds.		e. Factories.	
c. Savings accounts.		f. Tractor-trailer trucks.	

(2) [Shifts in demand and supply: 15 pts] Analyze each of the following markets according to the accompanying imaginary scenario.

a. Consider the market for ***electric cars***. Suppose the price of gasoline rises.

Does demand shift *left*, shift *right*, or remain *unchanged* ?	
Does supply shift *left*, shift *right*, or remain *unchanged* ?	
Does the equilibrium price *increase, decrease,* or *cannot be determined* ?	
Does the equilibrium quantity *increase, decrease,* or *cannot be determined* ?	

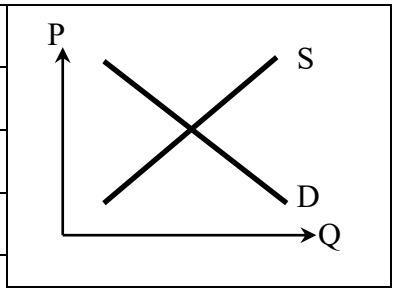
Sketch a graph of this scenario at right, showing which curve(s) shift(s).



b. Consider the market for ***wooden furniture***: Suppose the price of wood rises.

Does demand shift *left*, shift *right*, or remain *unchanged* ?	
Does supply shift *left*, shift *right*, or remain *unchanged* ?	
Does the equilibrium price *increase, decrease,* or *cannot be determined* ?	
Does the equilibrium quantity *increase, decrease,* or *cannot be determined* ?	

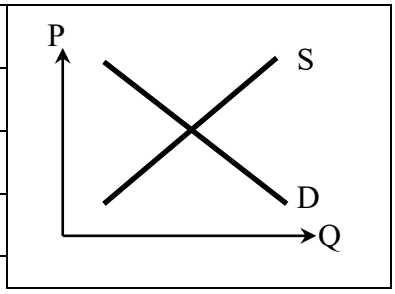
Sketch a graph of this scenario at right, showing which curve(s) shift(s).



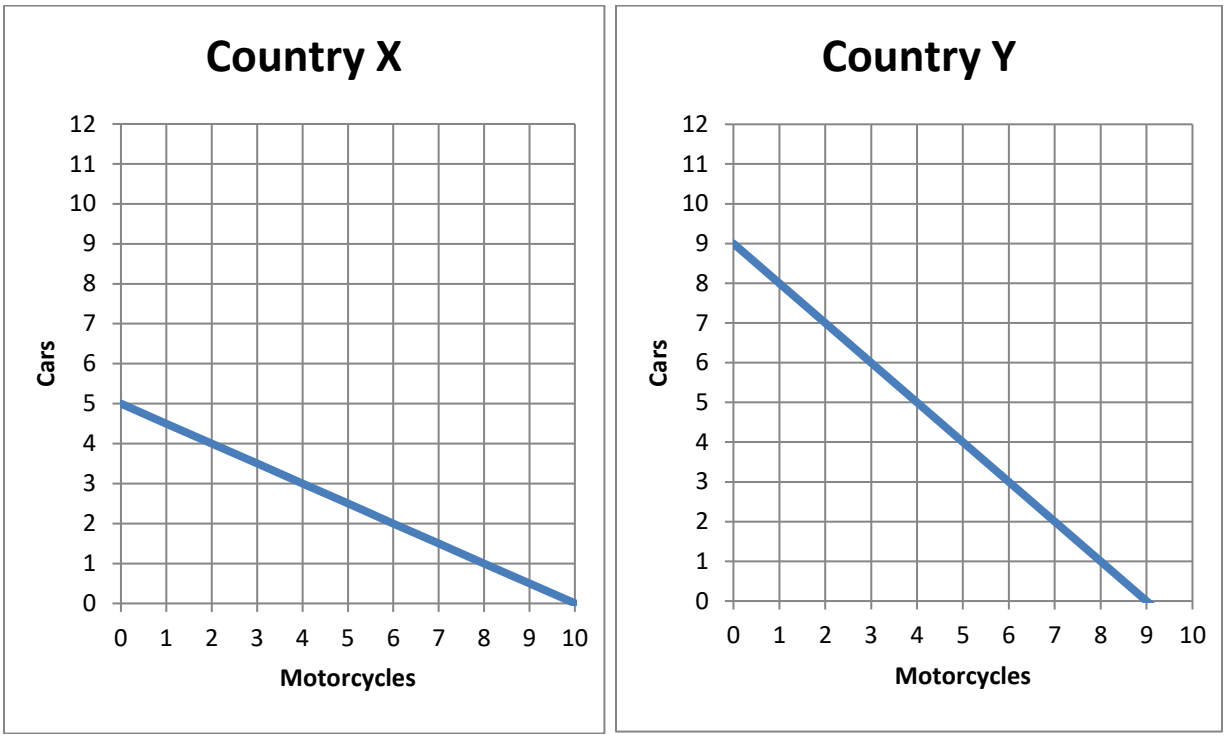
c. Consider the market for ***airline tickets***: Suppose the price of jet fuel rises. At the same time, a recession lowers consumers' incomes.

Does demand shift *left*, shift *right*, or remain *unchanged* ?	
Does supply shift *left*, shift *right*, or remain *unchanged* ?	
Does the equilibrium price *increase, decrease,* or *cannot be determined* ?	
Does the equilibrium quantity *increase, decrease,* or *cannot be determined* ?	

Sketch a graph of this scenario at right, showing which curve(s) shift(s).



(3) [Comparative advantage, gains from trade: 17 pts] Country X and Country Y can each produce cars and motorcycles. They each face a tradeoff between these two products because of limited workforces. Their production possibility curves are shown below.



a. What is Country X's opportunity cost of producing a motorcycle? cars

b. What is Country Y's opportunity cost of producing a motorcycle? cars

c. What is Country X's opportunity cost of producing a car? motorcycles

d. What is Country Y's opportunity cost of producing a car? motorcycles

e. Which country has a comparative advantage in producing motorcycles?

f. Which country has a comparative advantage in producing cars?

g. [3 pts] Fill in the blanks: *Both* countries can consume combinations of products *outside* their individual production possibility curves if _____ exports *three* cars to _____, which exports _____ motorcycles in return.

h. **Plot** the trade that you propose in part (g) on the graphs above. For each country, plot and label the starting point representing **production before trade**, and the ending point representing **consumption after trade**.

(4) [Spending approach to GDP: 12 pts] The table below shows data for the United States in a recent year as reported by the Bureau of Economic Analysis in trillions for a recent year. [Hint: Some of the data are extraneous and not needed for solving this problem.]

Exports	$2.1
State and local purchases	$2.5
Compensation of employees	$11.6
Transfer payments	$4.2
Consumption of services	$9.5
Business fixed investment	$2.9
Residential investment	$0.9
Consumption of durable goods	$1.6
Corporate profits	$2.4
Consumption of nondurable goods	$3.1
Personal dividend income	$1.4
Imports	$2.8
National defense purchases	$0.9
Federal nondefense purchases	$0.6
Depreciation (capital consumption of domestic business)	$2.4
Personal interest income	$1.5
Change in inventories	$0.1

a. Compute consumption (C).	$ trillion
b. Compute gross investment (I).	$ trillion
c. Compute net investment.	$ trillion
d. Compute government purchases (G).	$ trillion
e. Does the U.S. have a trade surplus or a trade deficit ?	
f. Compute net exports (X).	$ trillion

(5) [GDP and real GDP: 8 pts] In an imaginary country, only two final goods are produced, as shown in the following table. (You can use the boxes at right for scratch work.)

	Food		Clothing			
Year	Price	Quantity	Price	Quantity	2024 prices	2025 prices
2024	$3	100	$4	50		
2025	$6	100	$4	60		

a. Compute the growth rate of *nominal GDP* (also called "current-dollar GDP") from 2024 to 2025.	%
b. Compute the growth rate of GDP from 2024 to 2025 *in constant 2024 prices*.	%
c. Compute the growth rate of GDP from 2024 to 2025 *in constant 2025 prices*.	%
d. Compute the growth rate of *real GDP* from 2024 to 2025, as it would be computed by the U.S. Bureau of Economic Analysis.	%

(6) [Nominal GDP, real GDP, and inflation: 7 pts] The following table shows data for Chile, in billions of *pesos,* the Chilean currency.

Year	Nominal GDP	Real GDP	GDP price index or price deflator (to the nearest tenth)	Rate of inflation (to the nearest tenth of a percentage point)
1994	179	182		
1995	189	189		%
1996	196	191		%

a. [2 pts] Which is the base year for real GDP?

b. [3 pts] Compute the GDP price index for each year, to the nearest tenth, and insert it in the table above. [Hint: The price index should equal 100.0 in the base year.]

c. [2 pts] Compute the rate of inflation for the last two years, to the nearest tenth of a percentage point, and insert in in the table above.

(7) [Measuring the labor force: 8 pts] The U.S. Bureau of Labor Statistics reported the following data for December 2024. [Hint: Some of the data are extraneous and not needed for solving this problem.]

Employed persons working part time for economic reasons	5.3 million
New claims for unemployment insurance	0.3 million
Mean duration of unemployment	24.4 weeks
Not in labor force	103.3 million
Employed	164.0 million
Labor force	171.5 million
Job losers	3.5 million
Discouraged workers	0.5 million

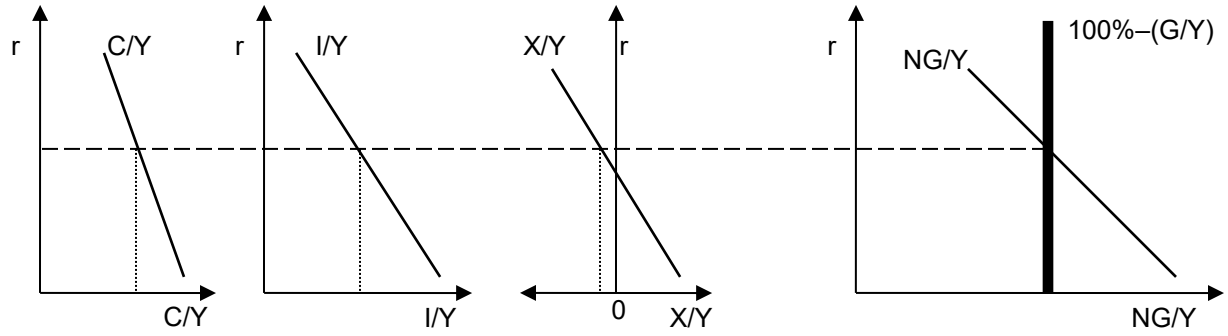
a. Compute the number of unemployed people to the nearest tenth of a million. million

b. Compute the unemployment rate to the nearest tenth of a percentage point. %

c. Compute the employment-to-population ratio to the nearest tenth of a percentage point. %

d. Compute the labor force participation rate to the nearest tenth of a percentage point. %

(8) [Interest rate and GDP shares—graph: 18 pts] Consider the following scenario. Suppose the government switches from an income tax to a consumption tax. Use the graphs below of the GDP spending shares model to answer the following questions.



a. According to this scenario, which curve shifts: consumption's share (C/Y), investment's share (I/Y), net exports' share (X/Y), or the vertical line representing 100%-(G/Y) ?	
b. Does it shift *left* or *right* ?	
c. As a consequence, does the downward-sloping (NG/Y) curve shift *left*, shift *right*, or remain *unchanged* ?	
d. Does the long-run real interest rate (r) *increase, decrease*, or remain *constant*?	
e. Does the share of consumption spending (C/Y) *increase, decrease*, or remain *constant*?	
f. Does the share of investment spending (I/Y) *increase, decrease*, or remain *constant*?	
g Does the share of net exports (X/Y) *increase, decrease*, or remain *constant*?	
h. Which spending component—*consumption, investment, government purchases,* or *net exports*—directly affects potential GDP in the long run?	
i. Given your answer to (h), in this scenario, will long-run growth *increase*, *decrease,* or *remain constant?*	

(9) [Technical change: 4 pts] In India over the period 1965 to 1990, the annual growth rate of output per worker was about 2.4%, and the annual growth rate of capital per worker was about 3.6%. Assume that the share of capital income plus depreciation in national income was about **(1/3),** as it is in the United States.

a. Compute the contribution of capital to productivity growth, to the nearest tenth of a percentage point.	%
b. Compute the contribution of technology to productivity growth, also called the Solow residual, to the nearest tenth of a percentage point.	%

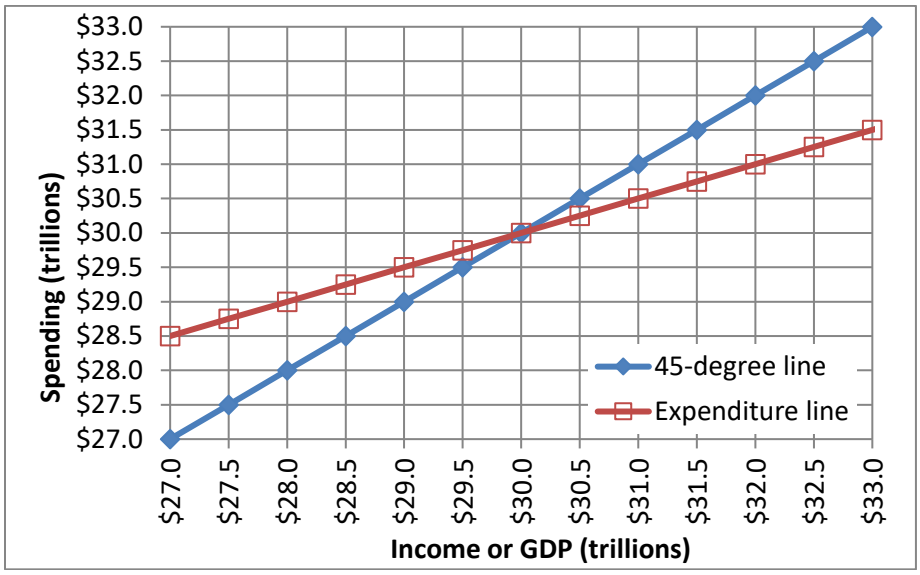
(10) [Quantity equation: 2 pts] Average annual growth rates for various items over the period 1970 to 1990 in the U.S. are reported below. [Hint: Some of the data are extraneous and not needed for this problem.]

Employment	1.4%
M2	7.0%
Consumer credit	7.2%
Real GDP	2.7%
Investment	3.6%

Assuming the velocity of money were constant, what should have been the average annual rate of inflation over this period, according to the quantity equation? Give an answer to the nearest tenth of a percentage point.

_____ %

(11) [Keynesian cross, Keynesian multipliers: 12 pts] The following is a Keynesian cross diagram, including a 45-degree line and an expenditure line.



a. What is the current level of real GDP—that is, the point of "spending balance"? $ _____ trillion

Suppose government purchases for defense spending *increase* by **$ 0.5 trillion**.

b. Does the expenditure line shift *up or down* in the short run? _____

c. By how much (measured vertically)? $ _____ trillion

d. Does GDP *increase or decrease* in the short run? _____

e. By how much? $ _____ trillion

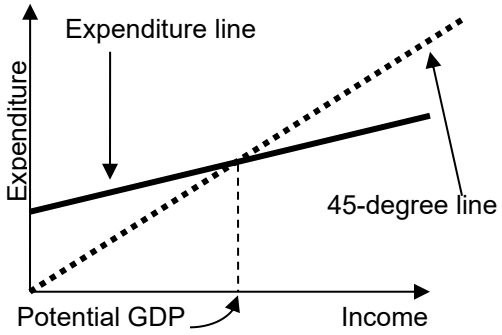
f. Compute the government-purchases multiplier from your previous answers to this problem. _____

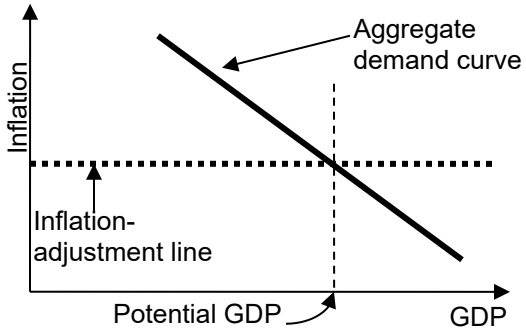
(12) [How business cycles begin: 20 pts] Assume GDP initially equals potential GDP and consider the *short-run* consequences of each scenario in the left column. Indicate whether and how the scenario shifts the expenditure line in the Keynesian cross diagram. Then indicate whether and how it shifts the "aggregate demand" (AD) curve in the diagram used in Taylor and Weerapana's textbook in the *short run*. Indicate whether the scenario is likely to cause a recession, a boom or neither (assuming GDP was initially equal to potential GDP).

	Expenditure line shifts *up, down* or *unchanged?*	AD curve shifts *left, right,* or *unchanged?*	Causes *recession, boom,* or *neither?*
a. Consumers become worried about the future and reduce their spending.			
b. Taxes are increased to reduce the budget deficit.			
c. New leadership at the Federal Reserve decides to "relax" monetary policy.			
d. Government purchases are decreased.			

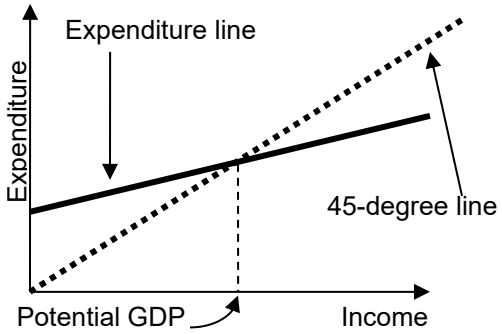
For each of these four scenarios, draw the shifts in curves on the next page.

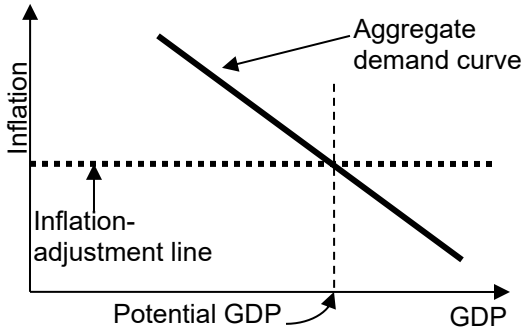
a. Consumers become worried about the future and reduce their spending.



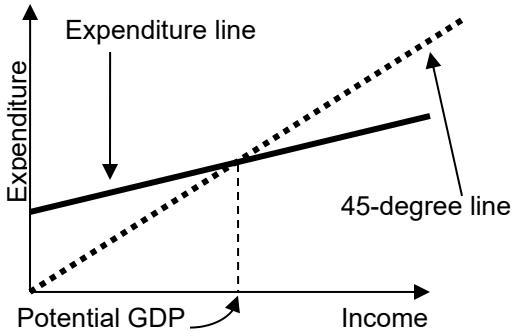


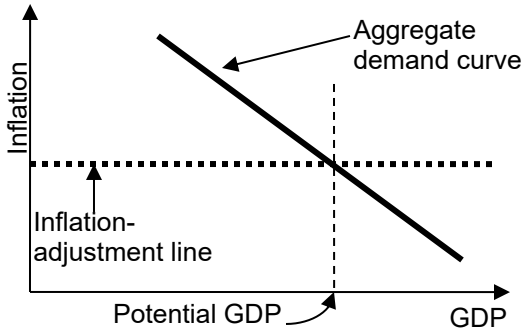
b. Taxes are increased to reduce the budget deficit.



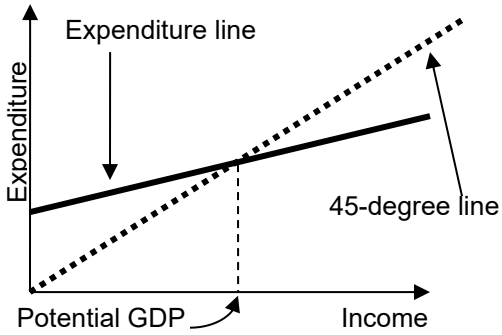


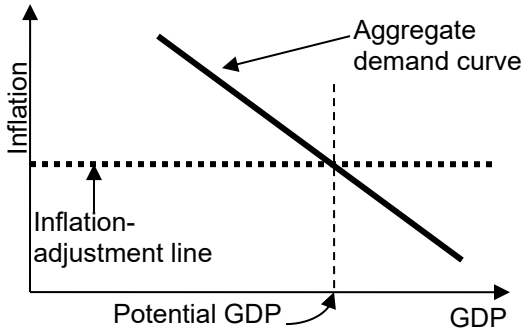
c. New leadership at the Federal Reserve decides to "relax" monetary policy.



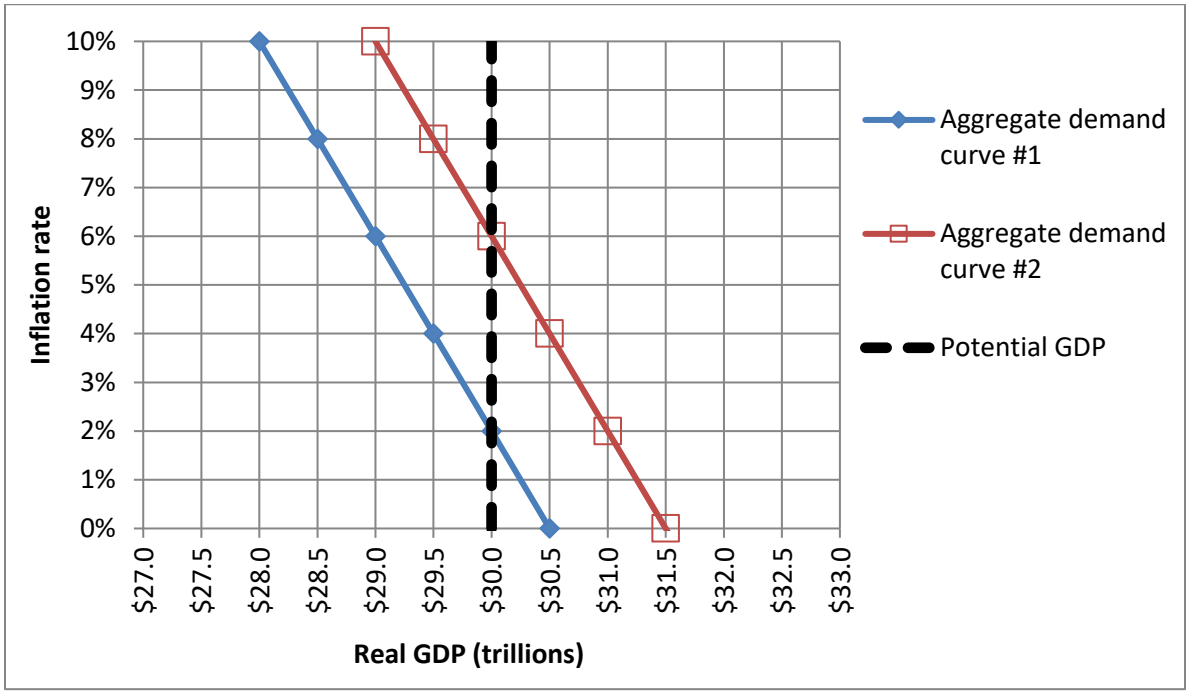


d. Government purchases are decreased.





(13) [Inflation adjustment: 16 pts] Consider the following graph of the macroeconomy, similar to those in the textbook by Taylor and Weerapana. Suppose that the aggregate demand curve is currently at "aggregate demand curve #1" and the inflation rate is currently **2%.** [Hint: Begin by drawing the "inflation adjustment" line.]



a. What is the current level of real GDP?

b. Is the unemployment rate currently *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment[1]?

$	trillion

Now suppose the government passes a large tax cut and the aggregate demand curve shifts to "aggregate demand curve #2."

c. What is the level of real GDP in the short run?

d. What is the inflation rate in the short run?

e. Is the unemployment rate *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment in the short run?

f. What will be the level of real GDP in the long run?

g. What will be the inflation rate in the long run?

h. Is the unemployment rate *greater* than the natural rate, *less* than the natural rate, or *equal* to the natural rate of unemployment in the long run?

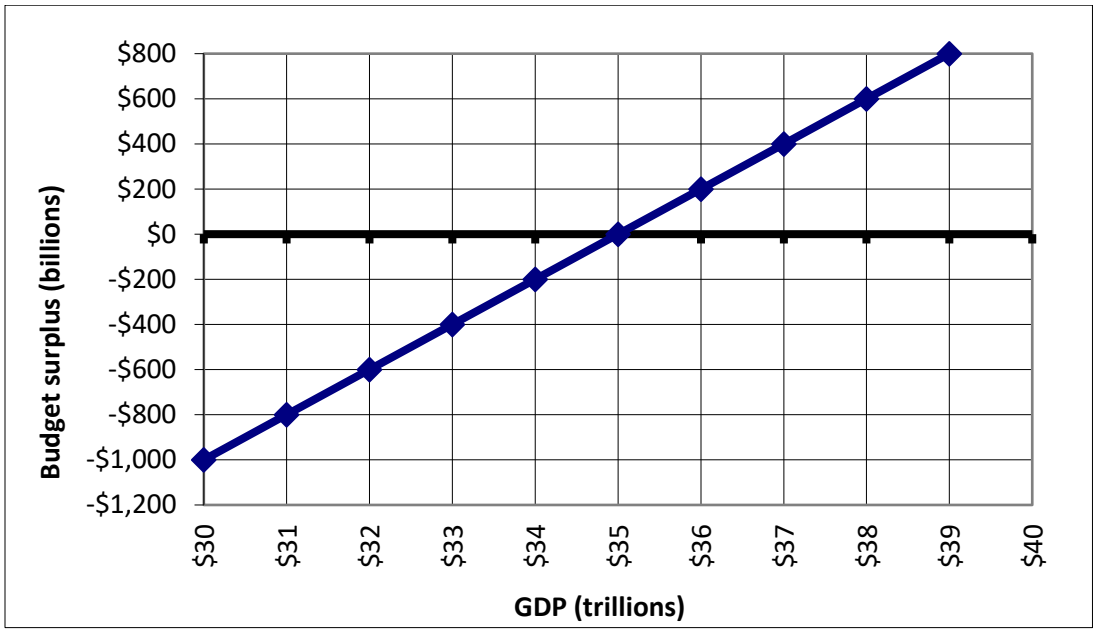
$	trillion
	%
$	trillion
	%

[1] Also called the "noncyclical rate of unemployment."

(14) [Fiscal policy: 6 pts] Indicate whether each item below represents a *discretionary policy* or an *automatic stabilizer*. If it is an automatic stabilizer, indicate whether it increases or decreases in a boom.

	Discretionary policy or *automatic stabilizer?*	If an automatic stabilizer, does it *increase* or *decrease* in a boom?
a. Defense spending.		
b. Unemployment insurance benefits.		
c. Tax revenues.		

(15) [Fiscal policy: 10 pts] The graph below shows the hypothetical relationship between the federal budget surplus (or deficit) and the level of GDP. Suppose potential GDP is $34.0 trillion and actual level of GDP is $36.0 trillion.



a. Is the economy in a boom, a recession, or neither?	
b. Is there an actual budget surplus, an actual budget deficit, or an actual balanced budget?	
c. How much?	$ billion
d. Is there a structural budget surplus, a structural budget deficit, or a structural balanced budget?	
e. How much?	$ billion

(16) [Monetary policy rule: 8 pts] Suppose the central bank follows the follows this monetary policy rule:

$$\textit{Interest rate} = (\textit{actual inflation} - 3\%) \times 0.5 + (\%\ \textit{output gap}) \times 0.5 + 3\%$$

Further, suppose actual inflation is 4% and real GDP is 2% *greater* than potential GDP.

a. What is the central bank's target rate of inflation?	%
b. Is inflation *above* target, *below* target, or *exactly at* the target rate of inflation?	
c. Is the economy experiencing a *boom*, a *recession*, or *neither*?	
d. Using this monetary policy rule, what interest rate should the central bank set?	%

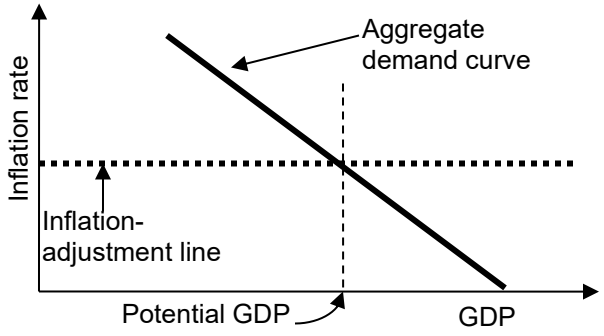
III. Critical thinking: Write a one-paragraph essay answering *one* question below (your choice). [4 pts]

(1) The model of Thomas Malthus predicts that output per worker will always return to the subsistence level—the so-called "iron law of wages." What assumptions did Thomas Malthus make that turned out to be wrong? Give two and explain why they matter. (Ignore the graph.)

(2) For 2026, the federal budget deficit is about $2 trillion and the money supply (M1) is about $20 trillion. Suppose, hypothetically, the Federal Reserve created enough new money to pay for the budget deficit. Assume the growth rate of real GDP is about 2 percent. Predict the inflation rate using the quantity equation. Justify your answer. (Ignore the graph.)

(3) Suppose the U.S. experiences a boom due to a rightward shift in aggregate demand for some reason. To prevent inflation from rising, should Congress enact a *tax cut* or a *tax increase*? Why? Illustrate your verbal explanation using the graph below.

Please circle the question you are answering and write your answer below. Full credit requires correct economic reasoning, legible writing, good grammar including complete sentences, and accurate spelling.



[end of exam]