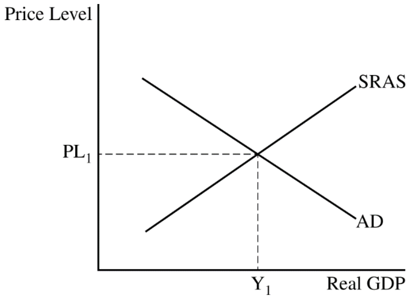
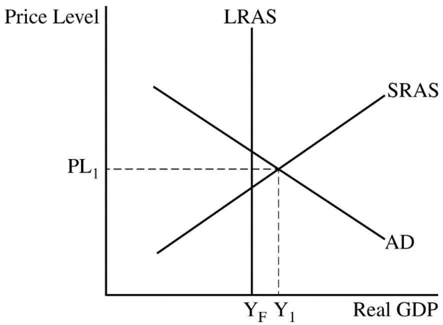
Question 3: Short — 5 points

A Point 1	State that the real GDP in 2021 was equal to the nominal GDP in 2021 and explain that because 2021 is the base year, no price level changes have occurred, and real values always equal nominal values in the base year.	**1 point**
B Point 2	Calculate the real GDP in Middleland in 2022 as \$1,190 and show your work. $\text{Real GDP} = (\$11 \times 50) + (\$4 \times 70) + (\$12 \times 30) = \$1{,}190$	**1 point**
C Point 3	Draw a correctly labeled aggregate demand–aggregate supply graph that shows PL_1 and Y_1 at the intersection of the aggregate demand (AD) and short-run aggregate supply (SRAS) curves.	**1 point**



Point 4	The graph must show a vertical long-run aggregate supply (LRAS) curve to the left of Y_1 and label the full-employment output as Y_F.	**1 point**

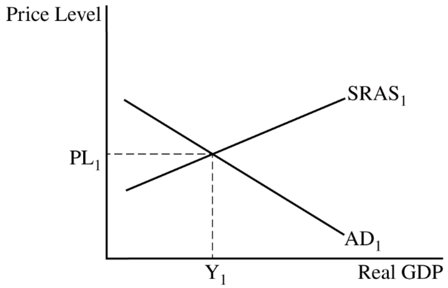


D Point 5	Calculate the minimum change in government spending as a decrease of \$8 and show your work.	**1 point**

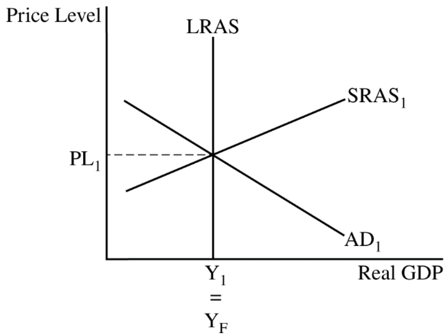
$$\text{Min Change} = \frac{\text{Output Gap}}{\text{Spending Multiplier}} = \frac{(\$1{,}150 - \$1{,}190)}{\frac{1}{(1-0.8)}} = \frac{-\$40}{5} = -\$8$$

Question 3: Short — 5 points

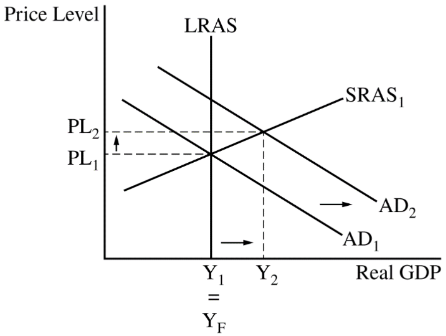
A Point 1	Draw a correctly labeled aggregate demand–aggregate supply graph that shows PL_1 and Y_1 at the intersection of the aggregate demand (AD) and short-run aggregate supply (SRAS) curves.	**1 point**



Point 2	The graph must show a vertical long-run aggregate supply (LRAS) curve at equilibrium real output $Y_1 = Y_F$.	**1 point**



B Point 3	On the graph from part A, show the short-run effect of the increase in real income in Thailand as a rightward shift of Nepal's aggregate demand curve, resulting in an increase in real output, labeled Y_2, and an increase in the price level, labeled PL_2.	**1 point**



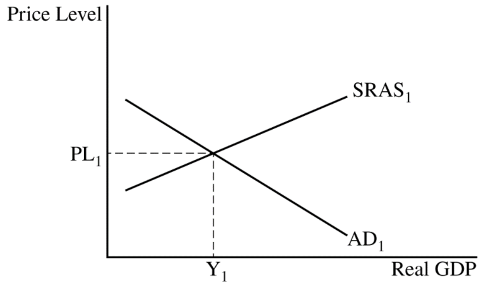
C Point 4	Calculate the minimum change in government spending as a decrease of 100 million rupees and show your work.	**1 point**

$$\text{Min Change} = \frac{-400 \text{ million rupees}}{\frac{1}{(1-0.75)}} = \frac{-400 \text{ million rupees}}{4} = -100 \text{ million rupees}$$

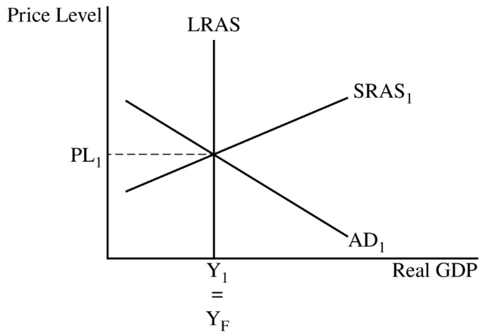
D Point 5	Explain that as real income rises, tax revenues will increase automatically (and/or transfer payments will decrease automatically), thereby slowing the rate at which disposable income is increasing, which will slow consumption growth.	**1 point**

Question 1: Long — 10 points

(a)	Draw a correctly labeled aggregate demand–aggregate supply graph that shows PL_1 and Y_1 at the intersection of the aggregate demand (AD) and short-run aggregate supply (SRAS) curves.	**1 point**



For the second point, the graph must show a vertical long-run aggregate supply (LRAS) curve at equilibrium real output $Y_1 = Y_F$. **1 point**

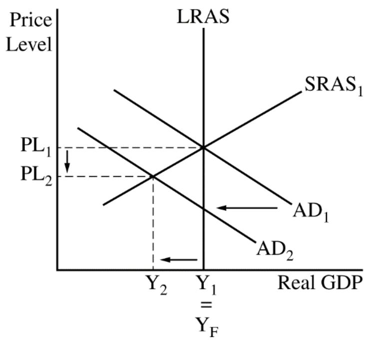


Total for part (a) 2 points

(b) (i)	Calculate the marginal propensity to consume as 0.4 and show your work.	**1 point**

$$\text{MPC} = \frac{\Delta \text{ Consumer Spending}}{\Delta \text{ Disposable Income}} = \frac{\$100{,}000 - \$110{,}000}{\$110{,}000 - \$135{,}000} = \frac{-\$10{,}000}{-\$25{,}000} = 0.4$$

(ii) On the graph from part (a), show the short-run effect of the decrease in consumer spending as a leftward shift of the AD curve, resulting in a decrease in the price level to PL_2 and a decrease in real output to Y_2. **1 point**

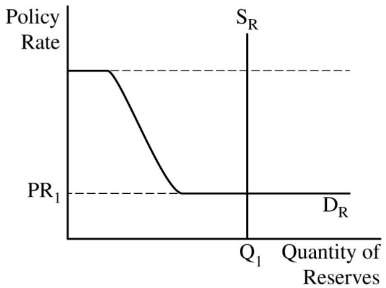


Total for part (b) **2 points**

(c) Explain that input prices (e.g., nominal wages) and/or inflationary expectations will decrease, causing SRAS to increase until it reaches full employment. **1 point**

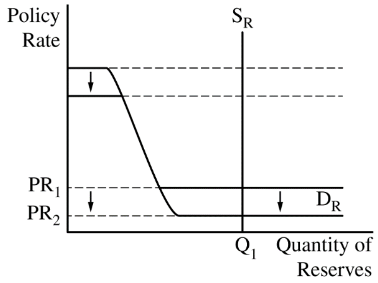
(d) State that the central bank would decrease its administered interest rates or decrease interest on reserves. **1 point**

(e) Draw a correctly labeled graph of the reserve market with the supply curve intersecting the demand curve in the range of ample reserves. **1 point**



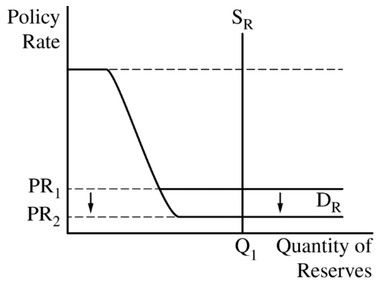
AP Macroeconomics: **2024 Set 2**

For the second point, the graph must show a decrease in the administered interest rates, resulting in a decrease in the policy rate. **1 point**



OR

For the second point, the graph must show a decrease in the lower bound of the demand curve for reserves, resulting in a decrease in the policy rate.



Total for part (e) **2 points**

(f) For the first point, state that the quantity of national savings would decrease and the unemployment rate would decrease. **1 point**

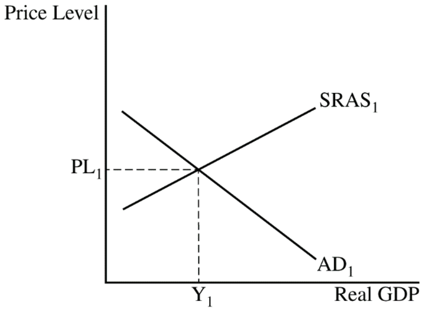
For the second point, explain that the decrease in nominal interest rates will increase interest-sensitive spending (consumption, investment, or net exports), causing an increase in aggregate demand and real output. **1 point**

Total for part (f) **2 points**

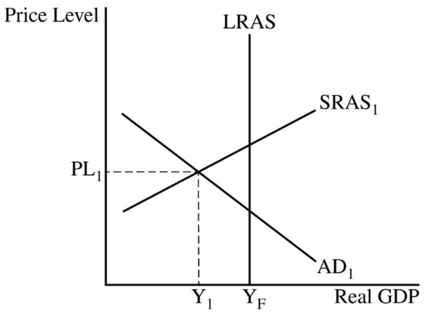
Total for question 1 **10 points**

Question 1: Long — 10 points

(a)	Draw a correctly labeled aggregate demand–aggregate supply graph that shows PL_1 and Y_1 at the intersection of aggregate demand and short-run aggregate supply.	**1 point**



For the second point, the graph must show a vertical long-run aggregate supply curve to the right of Y_1 and label the full-employment output as Y_F. — **1 point**



Total for part (a) — 2 points

(b)(i)	Explain that input prices (e.g., nominal wages) and/or inflationary expectations will decrease, causing SRAS to increase until it reaches full employment.	**1 point**
(ii)	State that the price level will be less than PL_1.	**1 point**

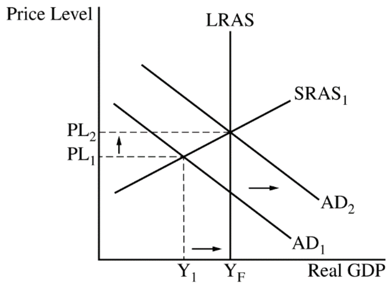
Total for part (b) — 2 points

(c) (i)	Calculate the minimum change in government spending as an increase of \$10 million and show your work.	**1 point**

$$\textbf{Minimum Change} = \frac{\textbf{Output Gap}}{\textbf{Spending Multiplier}} = \frac{\$50\ \textbf{million}}{\left(\frac{1}{0.2}\right)} = \frac{\$50\ \textbf{million}}{5}$$

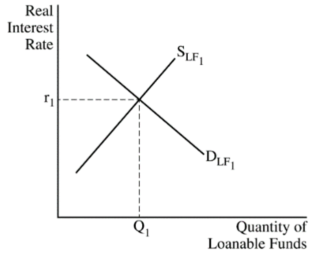
$$= \$10\ \textbf{million}$$

(ii)	On the graph from part (a), show the short-run effect of the change in government spending as a rightward shift of the aggregate demand curve where the new short-run equilibrium intersects the long-run aggregate supply curve at a higher equilibrium price level, labeled PL_2.	**1 point**

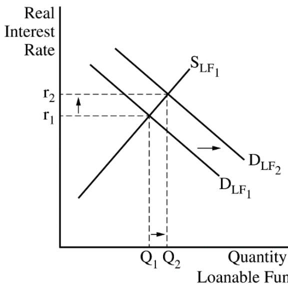


Total for part (c) — 2 points

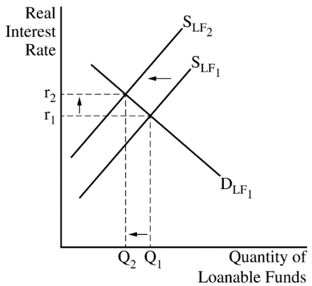
(d)	Draw a correctly labeled graph of the loanable funds market.	**1 point**



	For the second point, the graph must show an increase in the demand for loanable funds (or a decrease in the supply of loanable funds), resulting in an increase in the equilibrium real interest rate.	**1 point**



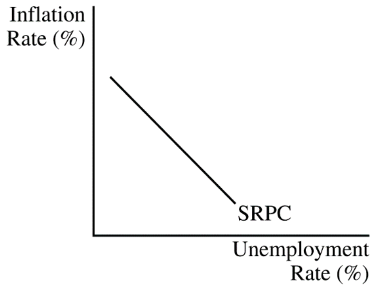
OR



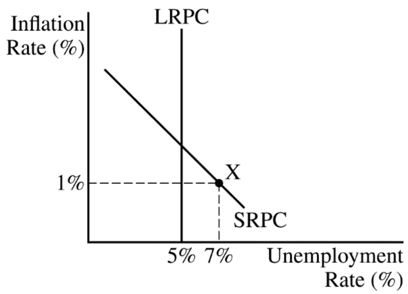
	Total for part (d)	**2 points**
(e)(i)	State that the price of previously issued bonds will decrease.	**1 point**
(ii)	State that the rate of economic growth in the long run will decrease and explain that an increase in the real interest rate means the cost of borrowing has increased, which will decrease investment spending on physical capital, human capital, and/or research and development.	**1 point**
	Total for part (e)	**2 points**
	Total for question 1	**10 points**

Question 1: Long — 10 points

(a)	Draw a correctly labeled graph of the short-run Phillips curve (SRPC).	**1 point**



	For the second point, the graph must include a vertical long-run Phillips curve (LRPC) at the natural rate of unemployment (5%) and must include point X on the SRPC to the right of the LRPC at the actual unemployment rate (7%) and the actual inflation rate (1%).	**1 point**



	Total for part (a)	**2 points**
(b)	State that the expected inflation rate is greater than 1% and explain that the actual unemployment rate (7%) is greater than the natural rate of unemployment (5%); or explain that the economy is in a recession.	**1 point**
(c) (i)	Calculate the maximum change in aggregate demand as \$180 billion and show your work.	**1 point**

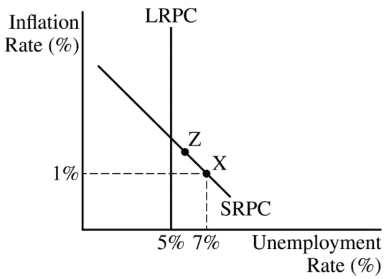
$$\text{Maximum } \Delta \text{ in AD} = -\$20 \text{ billion} \times \frac{-0.9}{1-0.9} = -\$20 \text{ billion} \times -9 = \$180 \text{ billion}$$

(ii)	Calculate the maximum change in aggregate demand as \$200 billion and show your work.	**1 point**

$$\text{Maximum } \Delta \text{ in AD} = \$20 \text{ billion} \times \frac{1}{1-0.9} = \$20 \text{ billion} \times 10 = \$200 \text{ billion}$$

	Total for part (c)	**2 points**

(d) On the graph from part (a), show point Z on the SRPC to the left of point X. **1 point**



(e) State that aggregate demand would increase and explain that the increase in disposable income would increase consumption spending. **1 point**

(f) (i) State that the short-run aggregate supply curve will shift to the right and explain that input prices (e.g., nominal wages) and/or inflationary expectations will decrease. **1 point**

(ii) State that the short-run Phillips curve will shift to the left. **1 point**

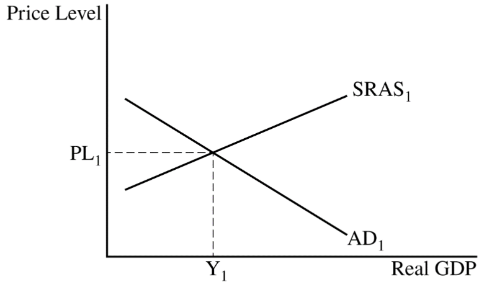
(iii) State that the actual unemployment rate will decrease. **1 point**

Total for part (f) 3 points

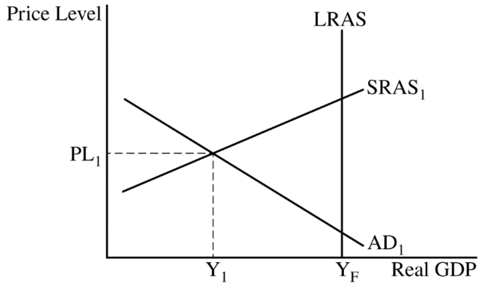
Total for question 1 10 points

Question 1: Long — 10 points

(a) Draw a correctly labeled aggregate demand-aggregate supply graph that shows PL_1 and Y_1 at the intersection of aggregate demand and short-run aggregate supply. **1 point**



For the second point, the graph must show a vertical long-run aggregate supply curve to the right of Y_1 and label the full-employment output Y_F. **1 point**



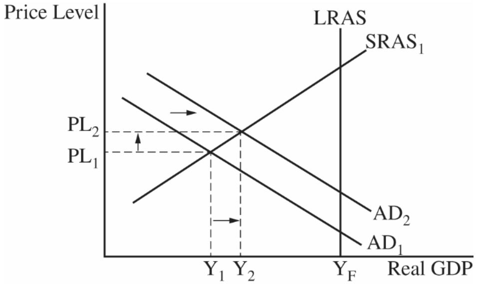
Total for part (a) 2 points

(b) State an increase in government spending, a decrease in taxes, or an increase in transfer payments. **1 point**

(c) Calculate the minimum change in investment spending as \$50 billion and show your work. **1 point**

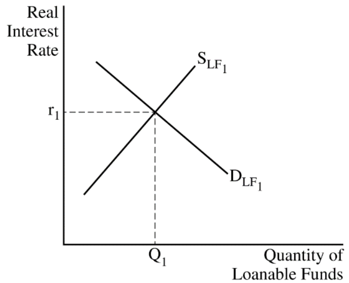
$$\text{Minimum Change in Investment Spending} = \frac{\$200 \text{ billion}}{\left(\frac{1}{0.25}\right)} = \$50 \text{ billion}$$

(d) On the graph from part (a), show the short-run effect of the change in investment spending as a rightward shift of the aggregate demand curve, resulting in a higher equilibrium price level and higher equilibrium real output that is less than full-employment output, labeled PL_2 and Y_2 respectively. **1 point**

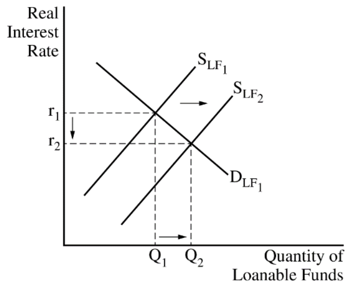


(e) State that the actual rate of unemployment is greater than the natural rate of unemployment and explain that the economy is still in a recessionary gap. **1 point**

(f) Draw a correctly labeled graph of the loanable funds market. **1 point**



For the second point, the graph must show a rightward shift in the supply of loanable funds curve, resulting in a decrease in the equilibrium real interest rate. **1 point**



Total for part (f) 2 points

(g) (i) State that real GDP will increase in the short run and explain that interest-sensitive spending (consumption, investment, or net exports) will increase, which will increase aggregate demand. **1 point**

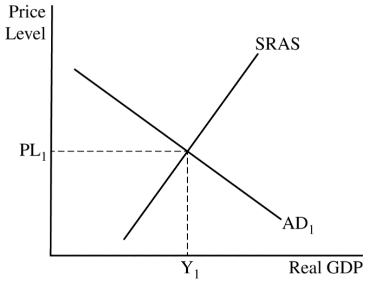
(ii) State that long-run aggregate supply will increase and explain that the decrease in the real interest rate means the cost of borrowing has decreased, which increases investment spending on plant and equipment and increases capital formation, which will increase potential output. **1 point**

Total for part (g) 2 points

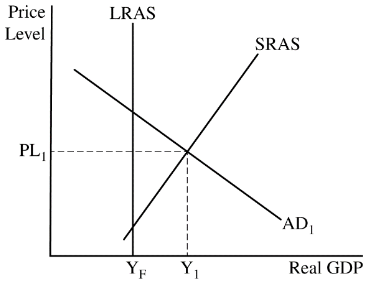
Total for question 1 10 points

Question 1: Long — 10 points

(a) Draw a correctly labeled aggregate demand-aggregate supply graph that shows PL_1 and Y_1 at the intersection of aggregate demand and short-run aggregate supply. **1 point**

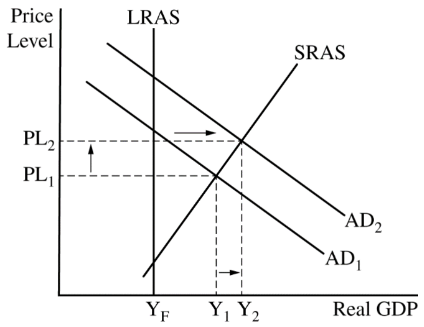


For the second point, the graph must show a vertical long-run aggregate supply curve to the left of Y_1 and label the full-employment output Y_F. **1 point**



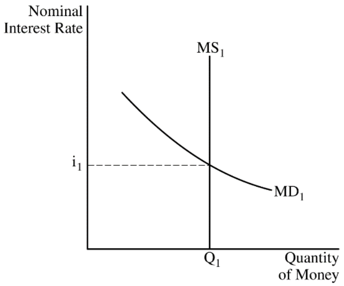
Total for part (a) **2 points**

(b) On the graph from part (a), show the short-run effect of the increase in government spending as a rightward shift of the aggregate demand curve, resulting in an increase in equilibrium real output and an increase in the equilibrium price level, labeled Y_2 and PL_2 respectively. **1 point**

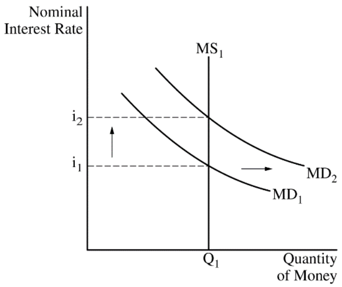


(c) State that the maximum increase in real output is $500 billion, and the maximum increase in household savings is $100 billion. **1 point**

(d) Draw a correctly labeled graph of the money market. **1 point**



For the second point, the graph must show a rightward shift in the money demand curve, resulting in a higher nominal interest rate. **1 point**



Total for part (d) **2 points**

(e) State that the price of previously issued bonds will decrease. **1 point**

(f) (i) State that the demand for dollars will decrease and explain that United States goods are relatively more expensive than European goods as a result of the increase in the inflation rate in the United States. **1 point**

(ii) State that the dollar will depreciate. **1 point**

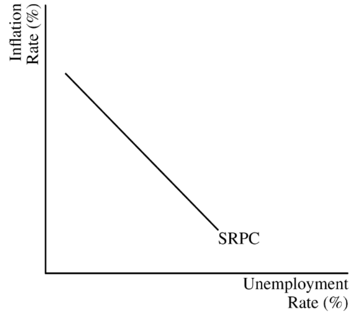
Total for part (f) **2 points**

(g) State that the Federal Reserve should sell the euro and buy the dollar. **1 point**

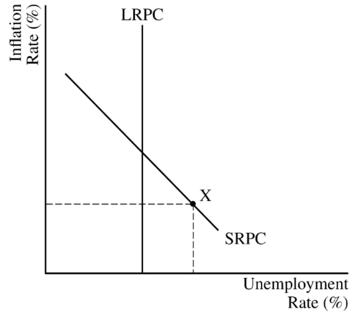
Total for question 1 **10 points**

Question 2: Short **5 points**

(a) Draw a correctly labeled graph of the SRPC. **1 point**



For the second point, the graph must include a correctly labeled LRPC and show point X on the SRPC to the right of the LRPC. **1 point**



Total for part (a) **2 points**

(b) (i) Calculate the minimum change in government spending as $150 billion and show your work. **1 point**

$$\frac{\text{Change in GDP}}{\text{Spending Multiplier}} = \frac{\$600 \text{ billion}}{1/(1-0.75)} = \frac{\$600 \text{ billion}}{4} = \$150 \text{ billion}$$

(ii) Calculate the minimum change in taxes as $200 billion and show your work. **1 point**

$$\frac{\text{Change in GDP}}{\text{Tax Multiplier}} = \frac{\$600 \text{ billion}}{-0.75/(1-0.75)} = \frac{\$600 \text{ billion}}{-3} = -\$200 \text{ billion}$$

Total for part (b) **2 points**

(c) Explain that SRAS will increase in the long run due to a decrease in nominal wages, input prices, or inflationary expectations. **1 point**

Total for question 2 **5 points**

2019

AP CollegeBoard

AP® Macroeconomics

Scoring Guidelines

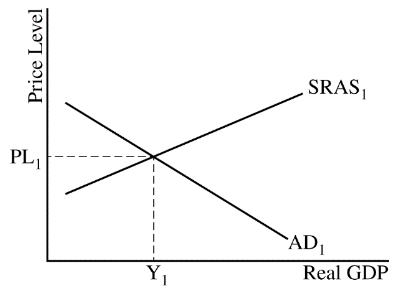
Set 1

2019 SCORING GUIDELINES

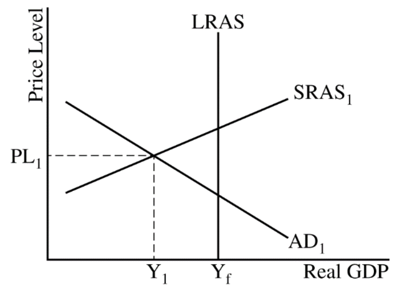
Question 1

10 Points (2 + 2 + 2 + 2 + 2)

(a) 2 points



- One point is earned for drawing a correctly labeled graph showing a downward sloping aggregate demand (AD) curve, an upward sloping short-run aggregate supply (SRAS) curve, the equilibrium output level labeled Y_1, and the equilibrium price level labeled PL_1.



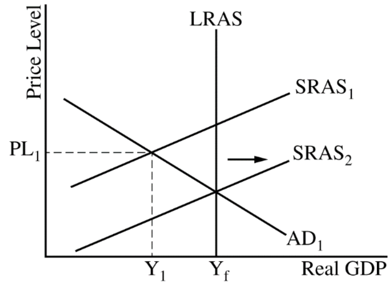
- One point is earned for drawing a correctly labeled vertical long-run aggregate supply (LRAS) curve with full employment output labeled Y_f to the right of the short-run equilibrium output level, Y_1.

(b) 2 points

- One point is earned for explaining that nominal wages, input prices, or expected inflation will decrease, causing the SRAS curve to shift to the right until real GDP reaches full employment at Y_f.

2019 SCORING GUIDELINES

Question 1 (continued)



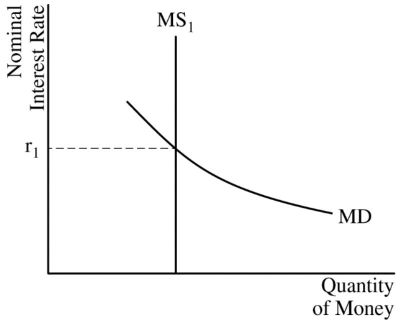
- One point is earned for showing a rightward shift in the SRAS curve intersecting the AD curve and LRAS curve at Y_f.

(c) 2 points

- One point is earned for correctly calculating the minimum change in government spending required to change aggregate demand by the amount of the output gap as an increase of \$8 billion ($= \frac{\$40 \text{ billion}}{5}$).

- One point is earned for correctly calculating the minimum change in taxes required to change aggregate demand by the amount of the output gap as a decrease of \$10 billion ($= \frac{\$40 \text{ billion}}{-4}$).

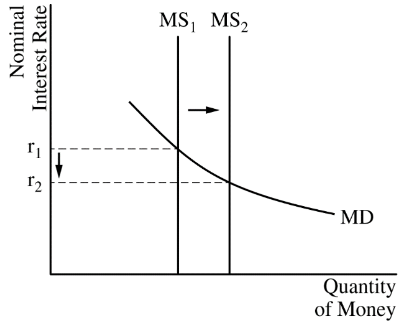
(d) 2 points



- One point is earned for drawing a correctly labeled graph of the money market.

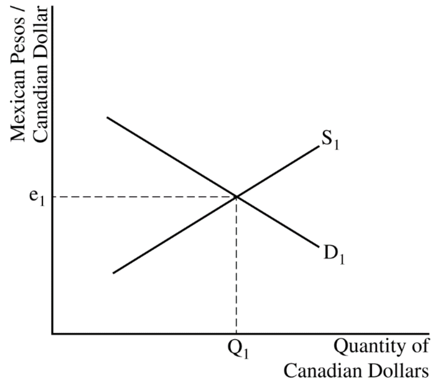
2019 SCORING GUIDELINES

Question 1 (continued)



- One point is earned for showing a rightward shift in the money supply curve, resulting in a lower nominal interest rate.

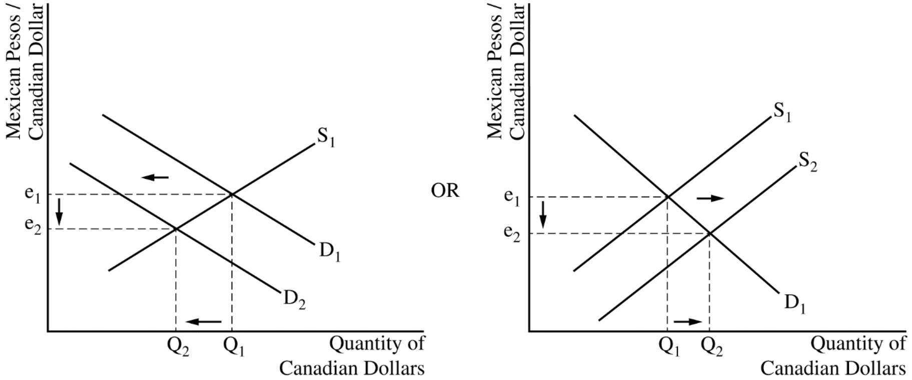
(e) 2 points



- One point is earned for drawing a correctly labeled graph of the foreign exchange market for the Canadian dollar.

2019 SCORING GUIDELINES

Question 1 (continued)



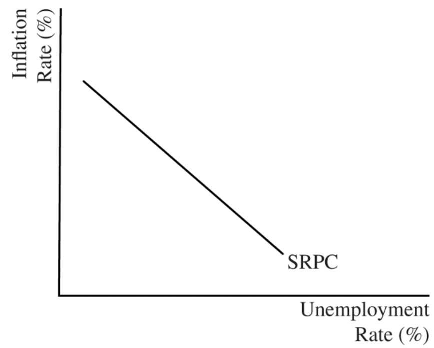
- One point is earned for showing a leftward shift of the demand curve for Canadian dollars (or a rightward shift of the supply curve of Canadian dollars) and for showing that the Canadian dollar will depreciate against the Mexican peso.

2019 SCORING GUIDELINES

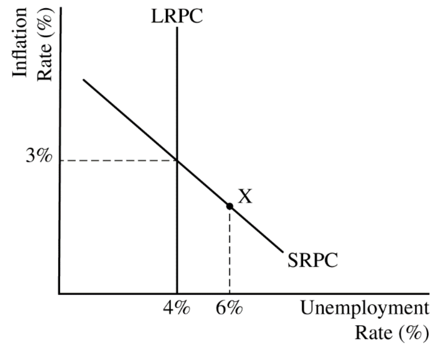
Question 2

5 Points (2 + 1 + 1 + 1)

(a) 2 points



- One point is earned for drawing a correctly labeled graph showing the short-run Phillips curve (SRPC).



- One point is earned for drawing the long-run Phillips curve (LRPC) showing the short-run equilibrium, labeled as point X, on the SRPC to the right of the LRPC, and for plotting the numbers in the correct places on the graph.

(b) 1 point

- One point is earned for stating that the actual inflation rate is less than the expected inflation rate.

2019 SCORING GUIDELINES

Question 2 (continued)

(c) 1 point

- One point is earned for stating that lenders will be better off and for explaining the real value of the loans that will be repaid will be higher than expected **OR** for explaining the relationship between the nominal and the real interest rates using the Fisher equation.

(d) 1 point

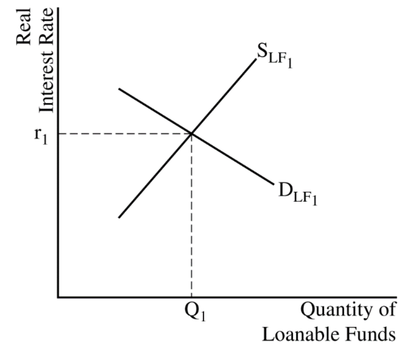
- One point is earned for stating that the natural rate of unemployment will not change in the long run.

2019 SCORING GUIDELINES

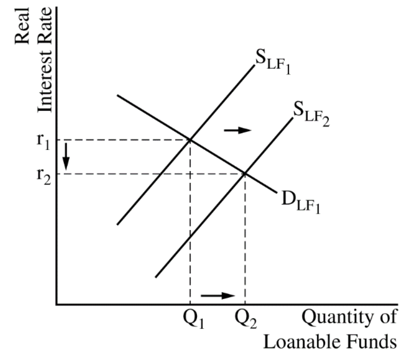
Question 3

5 Points (2 + 1 + 2)

(a) 2 points



- One point is earned for drawing a correctly labeled graph of the loanable funds market and identifying the equilibrium real interest rate and quantity of loanable funds.



- One point is earned for showing a rightward shift of the supply curve for loanable funds and for showing a lower equilibrium real interest rate.

(b) 1 point

- One point is earned for stating that Econland's purchases of foreign assets will increase and for explaining that Econland's investors will seek higher returns in other countries, which increases Econland's demand for foreign assets.

2019 SCORING GUIDELINES

Question 3 (continued)

(c) 2 points

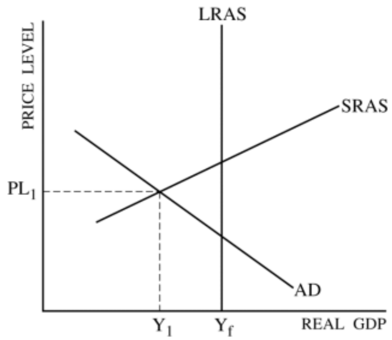
- One point is earned for stating that Econland's currency will depreciate.
- One point is earned for stating that Econland's central bank would buy its currency in the foreign exchange market.

AP® Macroeconomics
2015 Scoring Guidelines

2015 SCORING GUIDELINES

Question 1

10 points (2+1+2+3+2)

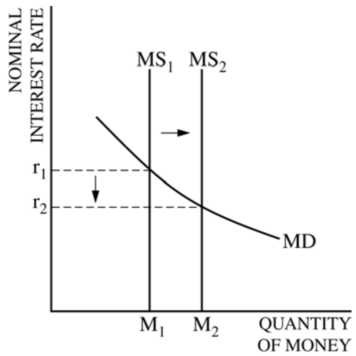


(a) 2 points:

- One point is earned for drawing a correctly labeled graph showing AD, SRAS, Y_1 and PL_1.
- One point is earned for drawing a vertical LRAS at Y_f to the right of Y_1.

(b) 1 point:

- One point is earned for stating that the Federal Reserve should target a lower federal funds rate.



(c) 2 points:

- One point is earned for drawing a correctly labeled money market graph.
- One point is earned for shifting the money supply curve to the right and showing a decrease in the nominal interest rate.

2015 SCORING GUIDELINES

Question 1 (continued)

(d) 3 points:

- One point is earned for calculating the minimum required change in government spending: $60 billion ($300/5=$60).
- One point is earned for stating that the minimum required change in taxes will be greater than the minimum required change in government spending.
- One point is earned for explaining that the tax multiplier (mpc/mps = 0.8/0.2 = 4) is smaller than the government spending multiplier (1/mps = 1/0.2 = 5) because part of the initial increase in disposable income caused by the decrease in income tax will be saved rather than spent.

(e) 2 points:

- One point is earned for stating that aggregate demand will increase and for explaining that lower income tax rates will increase disposable income and/or consumption and investment.
- One point is earned for stating that long-run aggregate supply will stay the same because lowering income taxes will increase consumption and/or investment, or there is no change in inputs.
  OR
  One point is earned for stating that long-run aggregate supply will increase in the long run because lowering taxes will increase savings and investment in physical capital, or because of increased incentives to work.
  OR
  One point is earned for stating that long-run aggregate supply will decrease in the long run because lowering taxes leads to a crowding out of private investment.

2015 SCORING GUIDELINES

Question 2

5 points (1+1+2+1)

(a) 1 point:

- One point is earned for stating that Country Y has an absolute advantage in producing solar panels.

(b) 1 point:

- One point is earned for calculating the opportunity cost of a furnace for Country Y: 2 solar panels per furnace.

(c) 2 points:

- One point is earned for stating that Country X has the comparative advantage in producing furnaces.
- One point is earned for explaining that Country X has a lower opportunity cost of producing furnaces than Country Y.

(d) 1 point:

- One point is earned for stating that Country X should produce solar panels domestically.

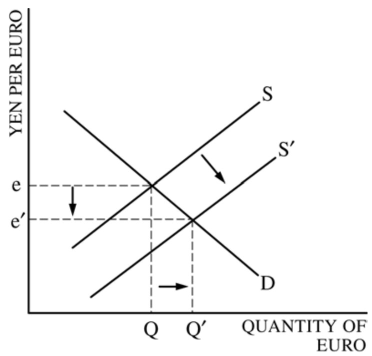
2015 SCORING GUIDELINES

Question 3

6 points (2+3+1)

(a) 2 points:

- One point is earned for stating that the real interest rate in Japan will increase in the short run because the supply of loanable funds will decrease or the demand for loanable funds will increase.
- One point is earned for stating that private domestic investment in plant and equipment in Japan will decrease.



(b) 3 points:

- One point is earned for drawing a correctly labeled graph of the foreign exchange market for the euro.
- One point is earned for showing that the supply curve for euros shifts to the right and for concluding that the yen price of the euro decreases.
- One point is earned for explaining that the European purchases of Japanese financial assets will increase due to the relatively higher rate of return in Japan.

(c) 1 point:

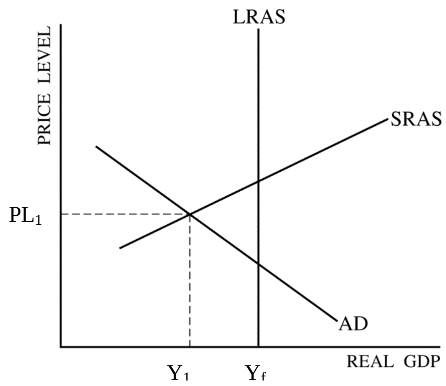
- One point is earned for stating that European Central Bank should buy euros.

AP® Macroeconomics 2014 Scoring Guidelines

2014 SCORING GUIDELINES

Question 1

11 Points (2+2+1+2+2+2)



2 points:

- One point is earned for drawing a correctly labeled graph showing an equilibrium with AD, SRAS, Y_1, and PL_1 labeled.
- One point is earned for drawing a vertical LRAS curve at Y_f to the right of the intersection of AD and SRAS.

2 points:

- One point is earned for stating that cyclical unemployment will decrease.
- One point is earned for stating that the natural rate of unemployment will not change.

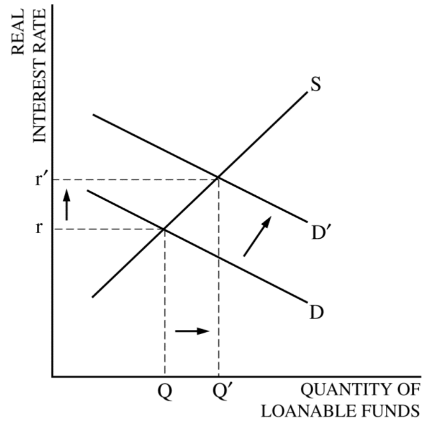
1 point:

- One point is earned for calculating the maximum change in real GDP:
  Change in GDP = (1/0.25) X \$100 billion = \$400 billion.

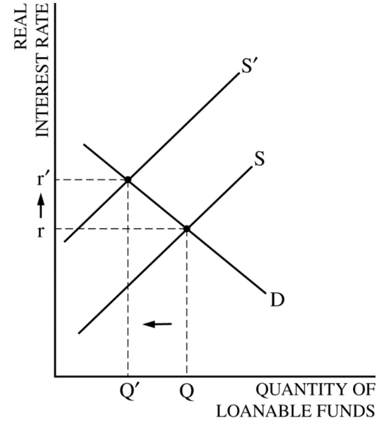
AP Macroeconomics: **2014**

2014 SCORING GUIDELINES

Question 1 (continued)



OR



2 points:

- One point is earned for drawing a correctly labeled loanable funds market graph.
- One point is earned for shifting the demand curve to the right (or shifting the supply curve to the left) and showing an increase in the real interest rate.

2 points:

- One point is earned for stating that the economic growth rate will fall.
- One point is earned for explaining that the higher real interest rate will slow down capital formation.

2 points:

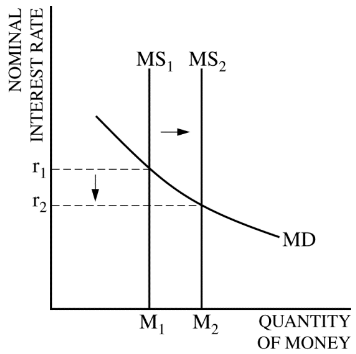
- One point is earned for stating that real gross domestic product will increase.
- One point is earned for explaining that the expansionary effect of the increase in government spending outweighs the contractionary effect of the increase in taxes of the same size. (Or students may explain by calculating the net increase in GDP, \$100 billion, or stating the tax multiplier is smaller than the spending multiplier.)

2014 SCORING GUIDELINES

Question 2

6 points (2+2+1+1)

2 points:
- One point is earned for stating that the Federal Reserve will buy government bonds.
- One point is earned for stating that the price of government bonds will increase.



2 points:
- One point is earned for drawing a correctly labeled graph of the money market.
- One point is earned for shifting the money supply curve to the right and showing a decrease in the nominal interest rate.

1 point:
- One point is earned for stating that the Federal Reserve purchase will not initially affect commercial banks' required reserves.

1 point:
- One point is earned for defining the discount rate as the interest rate that the Federal Reserve charges banks for borrowing from its discount window.

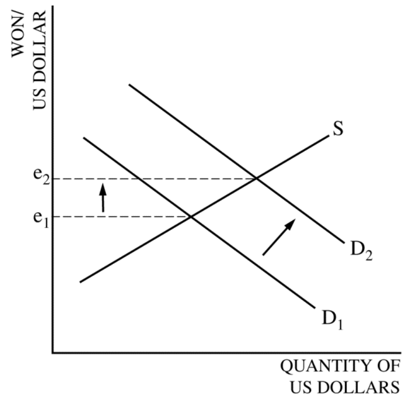
2014 SCORING GUIDELINES

Question 3

5 points (1+2+2)

1 point:
- One point is earned for stating that United States exports to South Korea will increase.

2 points:
- One point is earned for stating that the United States current account will be in surplus.
- One point is earned for stating that the United States gross domestic product will increase and explaining that higher U.S. exports increase AD (or that production increases to meet the increased export demand from South Korea).



2 points:
- One point is earned for drawing a correctly labeled graph of the foreign exchange market for the U.S. dollar.
- One point is earned for shifting the demand curve for the dollar to the right (and/or shifting the supply curve to the left) and showing an increase in the won price per dollar.