Chief Reader Report on Student Responses:

2023 AP® Macroeconomics Set 2

Free-Response Questions

- Number of Students Scored 148,836
- Number of Readers 226
- Score Distribution

Exam Score	N	%At
5	25,407	17.07
4	34,108	22.92
3	36,774	24.71
2	32,122	21.58
1	20,425	13.72

- Global Mean 3.08

The following comments on the 2023 free-response questions for AP® Macroeconomics were written by the Chief Reader, Samuel Andoh, Professor of Economics, Southern Connecticut State University. They give an overview of each free-response question and of how students performed on the question, including typical student errors. General comments regarding the skills and content that students frequently have the most problems with are included. Some suggestions for improving student preparation in these areas are also provided. Teachers are encouraged to attend a College Board workshop to learn strategies for improving student performance in specific areas.

Question 1

Task: Graph, Explain, Calculate, Assert
Topic: Phillips Curve, Fiscal Policy, and Long-Run Self-Adjustment
Max Score: 10
Mean Score: 4.22

What were the responses to this question expected to demonstrate?

The question examined students' understanding of the Phillips curve and how to use it to represent the state of an economy in a recession. Students were asked to assume that the economy of Northland is in short-run equilibrium with an actual unemployment rate of 7% and an actual inflation rate of 1%. The natural unemployment rate in Northland is 5%. Part (a) required students to draw a correctly labeled graph of the short-run and long-run Phillips curves, to label the current short-run equilibrium point as X, and to plot the relevant numerical values provided on the graph. In part (b) students were asked to assert whether the expected inflation rate is greater than, less than, or equal to 1% and to explain the assertion. In part (c) students were told to assume that the marginal propensity to consume is 0.9. They were asked in part (c)(i) to calculate the maximum change in aggregate demand if the government decreases income taxes by $20 billion and to show their work, and they were asked in part (c)(ii) to calculate the maximum change in aggregate demand if, instead, the government increases spending by $20 billion and to show their work. In part (d) students were asked to show on their graph in part (a) a possible new short-run equilibrium point labeled Z that would result if the government increased spending and there is no change in inflationary expectations. In part (e) students were asked how an increase in unemployment compensation would affect aggregate demand in the short run and to explain the assertion. Finally, in part (f) students were told to assume that the government takes none of the preceding policy actions. In part (f)(i) students were asked to state and explain what would happen to the short-run aggregate supply curve in the long run. In parts (f)(ii) and (f)(ii) students were asked to state what would happen to the short-run Phillips curve and the actual unemployment rate in the long run.

How well did the responses address the course content related to this question? How well did the responses integrate the skills required on this question?

Part (a) had two points. Sixty-three percent of students earned the first point by drawing a correctly labeled graph of the short-run Phillips curve (SRPC). Forty-five percent of students earned the second point by including a vertical long-run Phillips curve (LRPC) at the natural rate of unemployment at 5% and including point X on the SRPC to the right of the LRPC at the actual unemployment rate at 7% and the actual inflation rate at 1%.

In part (b) 42% of students correctly stated that expected inflation was greater than 1% and explained that the actual unemployment rate of 7% was greater than the natural rate of unemployment of 5% or because Northland was in a recession.

Part (c) had two points. In part (c)(i) 36% of students correctly calculated the maximum change in aggregate demand as the result of a change in income taxes and showed their work, and in part (c)(ii) 50% of students correctly calculated the maximum change in aggregate demand as the result of a change in government spending and showed their work.

In part (d) 48% of students correctly placed point Z on the short-run Phillips curve, representing the result of an increase in government spending with no change in inflationary expectations.

In part (e) 35% of students correctly explained that an increase in unemployment compensation would increase disposable income and increase aggregate demand.

Part (f) had three points. In part (f)(i) 24% of students correctly stated that the short-run aggregate supply curve would shift to the right in the long run and explained that the long-run self-adjustment of the economy from a recession entailed a decrease in inflationary expectations and/or a decrease in input prices. In part (f)(ii) 41% of students correctly asserted that the short-run Phillips curve would shift to the left in the long run. Finally, in part (f)(iii) 58% of students correctly stated that the actual unemployment rate would decrease in the long run.

What common student misconceptions or gaps in knowledge were seen in the responses to this question?

Common Misconceptions/Knowledge Gaps	*Responses that Demonstrate Understanding*
Parts (c)(i) and (c)(ii) • Difficulty with the tax multiplier and government spending multiplier; not setting up the problem correctly and showing incorrect math	• Showing the correct mathematical equations for the tax and government spending multipliers, using the correct numbers with correct numerical responses
Part (e) • Not making the connection between unemployment compensation and increased consumption due to increased disposable income • Misconception of the function of transfer payments by instead explaining that government spending increases	• Explaining that aggregate demand would increase because consumers have more disposable income, increasing consumption and aggregate demand
Part (f)(i) • Difficulty with explaining the long-run self-adjustment mechanism and not linking changes in input costs and/or inflationary expectations to the subsequent change in SRAS	• Explaining that short-run aggregate supply will increase in the long run because the economy will self-adjust as a result of the decrease in nominal wages, input prices, or inflationary expectations

Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve the student performance on the exam?

- Emphasize the differences between the tax multiplier and the expenditure multiplier.
- Emphasize the ceteris paribus assumption or other thing being equal. Students should be reminded that a change in one variable without an explicit statement that another variable has changed, means that other things remain unchanged.

What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?

Sign in to AP Classroom to access AP Daily videos and find questions on the topics and skills addressed in this question. AP teachers can assign the short AP Daily videos as homework, warm-ups, lectures, reviews, and more. AP teachers can also use the AP Question Bank in AP Classroom to enable students to practice and get feedback on formative topic questions and past AP Exam questions. Additional resources are available on the Classroom Resources section of the AP Macroeconomics course page.

Question 2

Task: Explain, Assert, Graph
Topic: Balance of Payments, Foreign Exchange Market
Max Score: 5
Mean Score: 1.40

What were the responses to this question expected to demonstrate?

The question examined students' understanding of the balance of payments and foreign exchange market. The question begins by telling students to assume that the United States and South Africa are trading partners with flexible exchange rates, and the United States' current account balance with South Africa is zero. In part (a) students were asked to state and explain whether United States net exports will increase, decrease, or remain unchanged if real income in the United States increased while real income in South Africa remained the same. In part (b) students were asked, based on their response in part (a), to state in part (b)(i) what will happen to the capital and financial account balance in the United States and to state and explain in part (b)(ii) what will happen to actual unemployment in South Africa in the short run. In part (c) students were told that the currency of the United States was the dollar (USD), and the currency of South Africa was the rand (ZAR). Students were asked to draw a correctly labeled graph of the foreign exchange market for the rand and show the effect of the increase in real income in the United States on the international value of the rand.

How well did the responses address the course content related to this question? How well did the responses integrate the skills required on this question?

In part (a) 24% of students correctly asserted that United States net exports will decrease and explained that demand for goods from South Africa, its trading partner, will increase.

Part (b) had two points. In part (b)(i) 24% of students correctly stated that the United States capital and financial account balance will move into surplus. In part (b)(ii) 16% of students correctly stated that unemployment in South Africa will decrease and explained that South Africa's exports to the United States will increase, which will increase its aggregate demand and its real GDP.

Part (c) had two points. Twenty-three percent of students earned the first point by drawing a correctly labeled graph of the foreign exchange market for the South African rand. Sixteen percent of students earned the second point by correctly shifting the demand curve for the rand to the right, resulting in an appreciation of the rand.

What common student misconceptions or gaps in knowledge were seen in the responses to this question?

Common Misconceptions/Knowledge Gaps	*Responses that Demonstrate Understanding*
Part (a) • Confusion around economic terminology—e.g., the difference between exports, imports, and net exports	• Stating that net exports will decrease and explaining that the demand for goods from South Africa will increase, which will increase U.S. imports
Part (b) • Treating the capital and financial account as two different accounts in balance of payments • Gaps in knowledge of the balance of payments—not understanding that a decrease in net exports (i.e., the current account) will cause an increase in the capital and financial account • Difficulty with explaining why an increase in imports from South Africa will cause a decrease in unemployment in South Africa	• Explaining that a decrease in net exports will cause an increase in the capital and financial account, thus moving it into surplus • Explaining in part that an increase in U.S. imports from South Africa will decrease unemployment in South Africa because this increases in South Africa's exports to the U.S., which will increase aggregate demand in South Africa, causing the unemployment rate to decrease in South Africa
Part (c) • Incorrectly expressing the price of the rand on the vertical axis • Not establishing an initial equilibrium in the graph • Shifting the incorrect curve	• Drawing a correctly labeled graph of the foreign exchange market with the correct exchange rate (USD/ZAR) labeled on the vertical axis • Establishing an initial equilibrium on a correctly labeled graph of the market for the rand • Shifting the demand curve to the right, showing an appreciation of the rand

Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve the student performance on the exam?

Questions that test content from unit 6 of the course are perennially challenging for students, and it may be because not enough time is spent on it as it comes at the end of the course. Teachers should emphasize balance of payments accounting (i.e., the current account + the capital and financial account = 0); the basic concepts of demand and supply to explain what the price in the foreign exchange market is: one currency per unit of another currency; and real income as a foreign exchange determinant.

What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?

Sign in to AP Classroom to access AP Daily videos and find questions on the topics and skills addressed in this question. AP teachers can assign the short AP Daily videos as homework, warm-ups, lectures, reviews, and more. AP teachers can also use the AP Question Bank in AP Classroom to enable students to practice and get feedback on formative topic questions and past AP Exam questions. Additional resources are available on the Classroom Resources section of the AP Macroeconomics course page, including resources for teaching the Balance of Payments and an article titled "International Economics and the AP Macroeconomics Course" that provides suggestions for how to incorporate the concepts of international economics earlier in the course.

Question 3

Task: Graph, Assert, Explain
Topic: Aggregate Demand–Aggregate Supply, Monetary Policy in an Ample Reserves Framework
Max Score: 5
Mean Score: 2.38

What were the responses to this question expected to demonstrate?

The question examined students' understanding of the aggregate demand–aggregate supply model and the effect of monetary policy on the economy. Students were told to assume that the economy of country Zen is in long-run macroeconomic equilibrium. In part (a) students were asked to draw a correctly labeled graph of the aggregate demand, short-run aggregate supply, and long-run aggregate supply curves and show (i) the current equilibrium real output and price level, labeling them Y_1 and PL_1, respectively, and (ii) the full-employment output, labeling it Y_F. In part (b) students were asked to show the short-run effect of an increase in consumer confidence on the graph in part (a) and to label the new equilibrium real output Y_2 and the new equilibrium price level PL_2. In part (c) students were told to assume that the banking system in Zen has ample reserves and that the central bank's goal is to maintain a stable price level at PL_1. Students were then asked, based on the change in the price level shown in part (b), to identify one specific monetary policy action the central bank would take to achieve its goal. Finally, in part (d), based on the monetary policy action identified in part (c), students were asked if real output would increase, decrease, or stay the same in the short run and to explain.

How well did the responses address the course content related to this question? How well did the responses integrate the skills required on this question?

Part (a) had two points. Seventy-six percent of students earned the first point by drawing a correctly labeled aggregate demand–aggregate supply graph showing PL_1 and Y_1 at the intersection of aggregate demand and short-run aggregate supply. Sixty percent of students earned the second point by showing a vertical long-run aggregate supply curve at equilibrium real output $Y_1=Y_F$.

In part (b) 71% of students correctly showed a rightward shift of the AD curve as a result of an increase in consumer confidence, resulting in an increase in real output, labeled Y_2, and an increase in the price level, labeled PL_2.

In part (c) 18% of students correctly stated that the central bank should increase its administered interest rates or increase interest on reserves.

Finally, in part (d) 18% of students correctly stated that, based on the action in part (c), real GDP will decrease and explained that interest-sensitive components of AD will decrease.

What common student misconceptions or gaps in knowledge were seen in the responses to this question?

Common Misconceptions/Knowledge Gaps	*Responses that Demonstrate Understanding*
Part (c) • Proposing monetary policy tools from a limited reserve regime in an ample reserve regime. Students often knew that a contractionary monetary policy was needed but proposed selling bonds or raising the required reserve ratio, which are monetary policy tools that are only appropriate in a limited reserves regime.	• Proposing the central bank should increase administered interest rates or interest on reserves, which are monetary policy tools that are appropriate in an ample reserves regime.

Based on your experience at the AP® Reading with student responses, what advice would you offer teachers to help them improve the student performance on the exam?

- Emphasize the different monetary policy tools used in both limited and ample reserves regimes.
- Encourage and practice with students to think through an event and the chain of causations and correct linkages to the logical outcome. This will help build their analytical skills.

What resources would you recommend to teachers to better prepare their students for the content and skill(s) required on this question?

Use the resources that have been released by the College Board for teaching monetary policy with ample reserves, which include:

- Two videos for teachers explaining the updates, available on AP Classroom
- Three revised practice exams, available on the AP Course Audit site and in AP Classroom
- Revised progress check questions, topic questions, question bank questions, and AP Daily videos available in AP Classroom

The Federal Reserve Bank of St. Louis has also developed a number of helpful resources for teaching the new tools of monetary policy that are available on its website: https://www.stlouisfed.org/education/teaching-new-tools-of-monetary-policy.