



Chief Reader Report on Student Responses: 2023 AP[®] Macroeconomics Set 1 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, Assert, Calculate

Topic: Aggregate Demand–Aggregate Supply, Long-Run Self-Adjustment, Fiscal Policy, Loanable Funds Market, Economic Growth

Max Score: 10

Mean Score: 4.71

What were the responses to this question expected to demonstrate?

The question examined students' understanding of the aggregate demand–aggregate supply model in a recessionary gap environment, self-adjustment to full employment in the long run, and the effects of fiscal policy on real GDP, the price level, the loanable funds market, and economic growth. The question began by asking students to assume that the economy of Vanderlandia is in short-run equilibrium with a real GDP of \$500 million; the full-employment level of real GDP is \$550 million. 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 assume that no policy action is taken to restore full employment and to (i) explain how the economy will self-adjust in the long run. Students were then asked to assert whether, after the long-run self-adjustment process, the price level in Vanderlandia is greater than, less than, or equal to PL_1 shown on their graph in part (a). In part (c) students were asked to assume instead that policymakers in Vanderlandia are considering changing government spending to restore full employment in the short run and that the marginal propensity to save is 0.2. Students were asked to (i) calculate the minimum change and state the direction of change in government spending required to completely close the output gap in the short run; students must show their work. In part (c)(ii) students were asked to show the short-run effect of the change in government spending in part (c)(i) on the aggregate demand–aggregate supply graph in part (a) and label the new equilibrium price level PL_2 . In part (d) students were asked to draw a correctly labeled graph of the loanable funds market and to show the effect of the change in government spending in part (c)(i) on the equilibrium real interest rate. Finally, in part (e), based on the change in the real interest rate shown on the graph in part (d), students were asked what will happen to (i) the price of previously issued bonds and (ii) the rate of economic growth in the long 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. Eighty-four 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 the aggregate demand and short-run aggregate supply curves. Eighty-one percent of students earned the second point by correctly placing the long-run aggregate supply curve to the right of the short-run equilibrium and labeling the full-employment output as Y_F .

Part (b) had two points. In part (b)(i) 28% of students correctly explained that the long-run adjustment from a recessionary gap involves a decrease in input prices and/or inflationary expectations, causing short-run aggregate supply to increase until it reaches full employment. In part (b)(ii) 58% of students correctly stated that after the long-run adjustment, the price level will be less than PL_1 .

Part (c) had two points. In part (c)(i) 48% of students correctly calculated the minimum change in government spending required to close the recessionary gap of \$50 million, given a marginal propensity to save of 0.2, as \$10 million, and showed their work. In part (c)(ii) 48% of students correctly showed a rightward shift of the aggregate demand curve that closed the output gap at a higher equilibrium price level, labeled PL_2 .

Part (d) had two points. Fifty-eight percent of students earned the first point by drawing a correctly labeled loanable funds market, and 48% of students earned the second point by correctly shifting the demand for loanable funds curve to the right or the supply of loanable funds curve to the left, resulting in an increase in the equilibrium real interest rate.

Part (e) had two points. In part (e)(i) 51% of students correctly stated that the price of previously issued bonds will decrease. In part (e)(ii) 15% of students correctly stated that the rate of long-run economic growth will decrease and explained that the increase in the real interest rate will decrease investment spending on physical capital, human capital, and/or research and development.

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

<i>Common Misconceptions/Knowledge Gaps</i>	<i>Responses that Demonstrate Understanding</i>
Part (b)(i) <ul style="list-style-type: none"> Difficulty with explaining the long-run self-adjustment mechanism. 	<ul style="list-style-type: none"> An explanation of long run self-adjustment that includes a change in either input prices, nominal wages, or inflationary expectations.
Part (e)(ii) <ul style="list-style-type: none"> Difficulty with explaining the effect of changes in the real interest rate in the long run using the correct linkages and macroeconomic economic variables. 	<ul style="list-style-type: none"> An explanation that links the effect of changes in the real interest rate in the long run on investment spending on physical capital, human capital, and/or research and development and the effect on the rate of long-run economic growth.

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?

- In the classroom, emphasize the chain of causation behind any change. This will expose any faulty reasoning and enable misunderstandings to be corrected at an early stage. It also helps students to develop their analytical skills.
- Emphasize the role of investment in physical capital on capital formation and economic growth.

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: Graph, Assert, Explain

Topic: Phillips Curve, Monetary Policy in an Ample Reserves Framework, Foreign Exchange Effects

Max Score: 5

Mean Score: 1.81

What were the responses to this question expected to demonstrate?

This question examined students' understanding of the Philips curve and how to use it to model the state of an economy; monetary policy actions in an ample reserve framework; and the effects of an interest rate change on international financial capital flows and the foreign exchange market. In part (a) students were told that Noralandia is in short-run equilibrium with an actual inflation rate that is currently higher than the expected inflation rate. They were then asked to draw a correctly labeled graph of the short-run and long-run Phillips curves and to label the current short-run equilibrium point as X. In part (b) students were told that the banking system in Noralandia has ample reserves. They were then asked to identify a specific monetary policy action that the central bank of Noralandia would take to bring the inflation rate closer to the expected inflation rate. In part (c) students were told that Noralandia has an open economy and a flexible exchange rate. Based solely on the effect of the monetary policy action identified in part (b) on interest rates in Noralandia, students were asked if there will be an increase, a decrease, or no change in the flow of international financial capital into Noralandia and to explain. Finally, in part (d), based on their answer in part (c), students were asked what will happen to the international value of Noralandia's currency 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?

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-five percent of students earned the first point by drawing a correctly labeled short-run Phillips curve, and 48% of students earned the second point by drawing a correctly labeled long-run Phillips curve and showing point X on the short-run Phillips curve to the left of the long-run Phillips curve.

In part (b) 14% of students correctly stated that the central bank should increase its administered interest rates or increase interest on reserves.

In part (c) 29% of students correctly stated that there will be an increase in international capital inflows and explained that investors will seek higher returns on financial capital in Noralandia.

In part (d) 41% of students correctly stated that Noralandia's currency will appreciate and explained that there will be an increase in the demand for its currency.

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

<i>Common Misconceptions/Knowledge Gaps</i>	<i>Responses that Demonstrate Understanding</i>
Part (b) <ul style="list-style-type: none">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.	<ul style="list-style-type: none">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.
Part (c) <ul style="list-style-type: none">Not being able to link an increase in interest rates to an inflow of financial capital from foreign investors seeking higher returns.	<ul style="list-style-type: none">Explaining that foreign investors will want to earn the relatively higher real interest rate, resulting in an inflow of financial capital.

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>.

Question 3

Task: Calculate, Explain, Graph, Assert

Topic: Unemployment, Output Gap, PPC

Max Score: 5

Mean Score: 3.12

What were the responses to this question expected to demonstrate?

This question tested students' understanding of unemployment, output gaps, and the production possibilities curve. Students were told to assume that in the country of Zeta, the civilian noninstitutional population aged 16 and over is 1,000,000; the labor force participation rate is 70%, the unemployment rate is 9%, and the natural rate of unemployment is 5%. In part (a) students were asked to calculate the number of people in Zeta that are unemployed and to show their work. In part (b) students were asked if the economy of Zeta is currently experiencing a recessionary gap, an inflationary gap, or no output gap and to explain. In part (c) students were told that the economy of Zeta produces consumer goods and capital goods. They were asked to draw a correctly labeled graph of the production possibilities curve for Zeta and to indicate a point, labeled A, that represents the current state of Zeta's economy. Finally, in part (d) students were asked if some individuals who were previously counted as unemployed in Zeta stop looking for work what will happen to (i) the labor force participation rate and explain, and (ii) the unemployment rate.

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) 51% of students correctly calculated the number of people who are unemployed from the given data and showed their work.

In part (b) 65% of students stated that Zeta is currently experiencing a recessionary gap and explained that the current unemployment rate of 9% is higher than the natural rate of unemployment of 5%.

In part (c) 67% of students drew a correctly labeled PPC showing a point A inside the frontier.

Part (d) had two points. In part (d)(i) 61% of students correctly stated that the labor force participation rate will decline and explained that if people who were previously unemployed become discouraged, they will no longer be counted as unemployed. In part (d)(ii) 71% of students correctly stated that the unemployment rate will decrease.

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

<i>Common Misconceptions/Knowledge Gaps</i>	<i>Responses that Demonstrate Understanding</i>
<ul style="list-style-type: none">• None	

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?

Do some calculation examples and emphasize the importance of showing correct work.

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

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