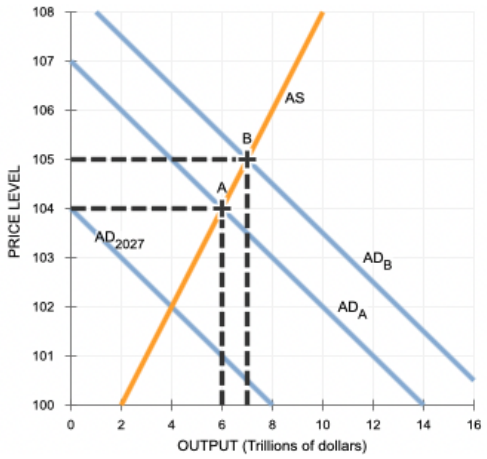
Problem Sets 10

1. Aggregate demand, aggregate supply, and the Phillips curve

In the year 2027, aggregate demand and aggregate supply in the imaginary country of Aso-Kuju are represented by the curves AD2027 and AS on the following graph. The price level is currently 102. The graph also shows two potential outcomes for 2028. The first possible aggregate demand curve is given by the curve labeled AD_A curve, resulting in the outcome given by point A. The second possible aggregate demand curve is given by the curve labeled AD_B, resulting in the outcome given by point B.



Suppose the unemployment rate is 7% under one of these two outcomes and 5% under the other. Based on the previous graph, you would expect _____ to be associated with the lower unemployment rate (5%).

If aggregate demand is low in 2028, and the economy is at outcome A, the inflation rate between 2027 and 2028 is _____.

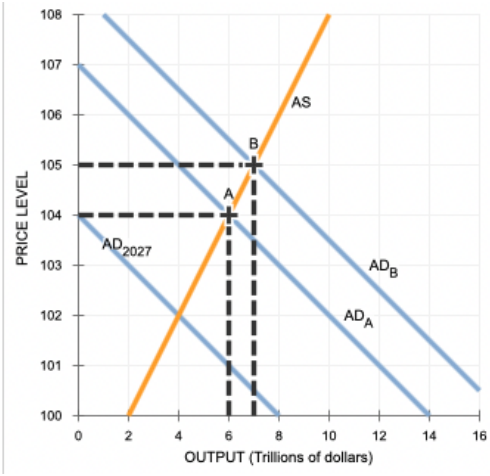
Based on your answers to the previous questions, on the following graph use the purple point (diamond symbol) to plot the unemployment rate and inflation rate if the economy is at point A. Next, use the green point (triangle symbol) to plot the unemployment rate and inflation rate if the economy is at point B. (As you place these points, dashed drop lines will automatically extend to both axes.) Finally, use the black line (cross symbol) to draw the short-run Phillips curve for this economy in 2028.

Note: For graphing purposes, round the inflation rate under each outcome to the nearest whole percent. For example, round 1.9% to 2.0%. Hint: Hover your cursor over each point after you plot it to make sure you have placed it on the exact coordinate you intended.

Suppose that the government is considering enacting an expansionary policy in 2027 that would shift aggregate demand in 2028 from AD_A to AD_B. This would cause a _____ the short-run Phillips curve, resulting in _____ in the inflation rate and _____ in the unemployment rate.

2. The Phillips curve in the short run and long run

The graph plots aggregate demand (AD_{2027}) and aggregate supply (AS) for the imaginary country of Patagonia in the year 2027. Suppose the natural level of output in this economy is $6 trillion. On the following graph, use the green line to plot the long-run aggregate supply (LRAS) curve for this economy.



Economists forecast that if the government takes no action and the economy continues to grow at the current rate, aggregate demand in 2028 will be given by the curve labeled AD_A, resulting in the outcome given by point A. If, however, the government pursues an expansionary policy, aggregate demand in 2028 will be given by the curve labeled AD_B, resulting in the outcome given by point B.

The following table presents projections for the unemployment rates that would occur at point A and point B. Consider the potential rate of inflation between 2027 and 2028, depending on whether the economy moves from the initial price level of 102 to the price level at outcome A or the price level at outcome B. Complete the table by entering the inflation rate at each potential outcome point. **Note**: Calculate the inflation rate to two decimal points of precision.

	Unemployment Rate	Inflation Rate
A	6%	
B	3%	

Based on your answers to the preceding parts, use another line (plus symbol) to draw the short-run Phillips curve (SRPC) for this economy in 2028. The short-run Phillips curve is _____ line:

A. Representing the tradeoff between unemployment and inflation
B. At the natural level of output
C. At the natural rate of unemployment

Now consider the long-run effects of this policy. Suppose, in particular, that following implementation of the policy, the aggregate demand curve remains at AD_B. The long-run equilibrium that would follow such a policy is designated outcome C.

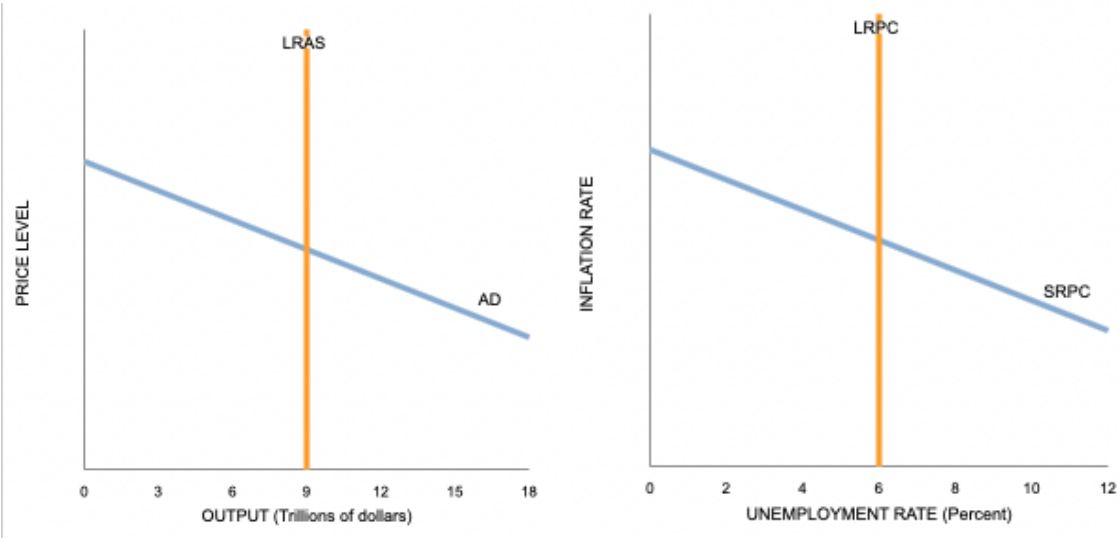
Going back to the **first** graph, place the point at outcome C. Because output at point C is _____ the natural level of output, the unemployment rate associated with outcome C is _____ the natural rate of unemployment.

Finally, use a new line to draw the long-run Phillips curve (LRPC) on the second graph. This line is _____ line:

A. At the natural rate of unemployment
B. Representing the tradeoff between unemployment and inflation
C. At the natural level of output

3. The long-run effects of monetary policy

The following graphs plot the long-run equilibrium situation for an economy. The left graph plots the aggregate demand (AD) and long-run aggregate supply (LRAS) curves. The right graph plots the long-run and short-run Phillips curves (LRPC and SRPC, respectively).



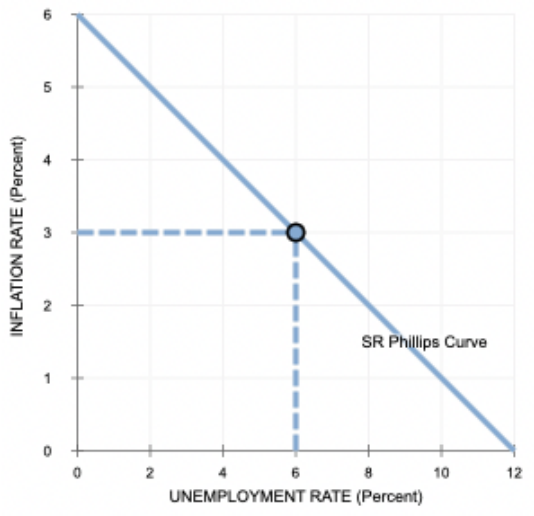
Which of the following statements are true based on these graphs? Check all that apply.

A. The natural rate of unemployment is 6%.
B. It is impossible to determine the natural rate of unemployment from these graphs alone.
C. The natural level of output is 6%.

Suppose the central bank of the economy pursues a policy that increases the money supply. Show the long-run effects of this policy on both of the graphs by shifting the appropriate curves. The long-run effect of the central bank's policy is _____ in the inflation rate, _____ in the unemployment rate, and _____ in real GDP.

4. Monetary policy and the Phillips curve

The following graph plots the short-run Phillips curve for a hypothetical economy. The given point on the graph indicates the initial rates of unemployment and inflation. Assume that the economy is currently in long-run equilibrium.



1) Suppose the central bank of the hypothetical economy decides to increase the money supply. Using the graph, shift the curve or drag the blue point along the curve, or do both, to show the short-run effects of this policy. Hint: You may assume that the central bank's move was unanticipated.

2) In the short run, an unexpected increase in the money supply results in _____ in the inflation rate and _____ in the unemployment rate.

3) Using the graph, shift the curve or drag the blue point along the curve, or do both, to show the long-run effects of the increase in the money supply.

4) In the long run, the increase in the money supply results in _____ in the inflation rate and _____ in the unemployment rate (relative to the economy's initial equilibrium).

5. The Phillips curve in the late 20th century

The following table presents historical unemployment and inflation data in the United States for the years 1974 through 1978.

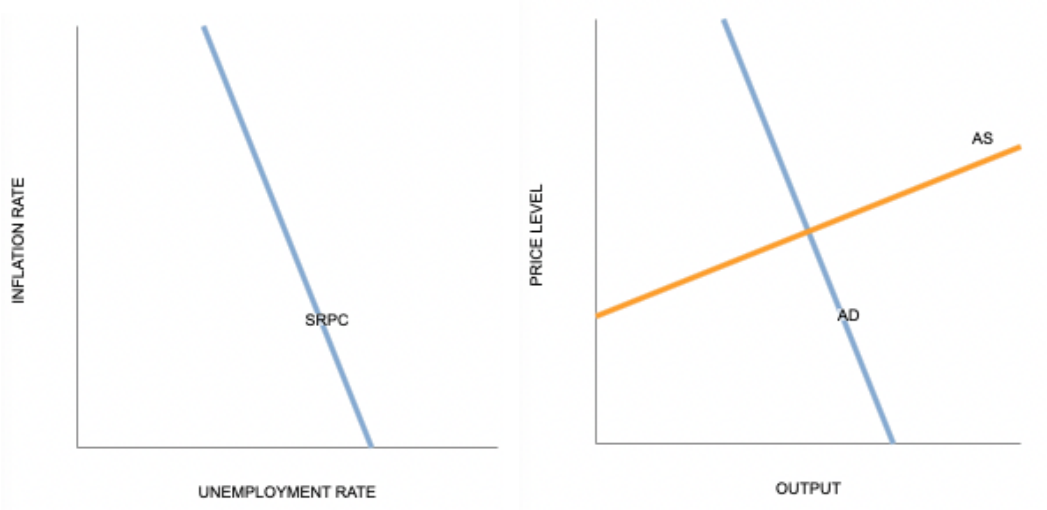
Year	Unemployment Rate (Percent)	Inflation Rate (Percent)
1974	5.6	11.0
1975	8.5	9.1
1976	7.7	5.8
1977	7.1	6.5
1978	6.1	7.6

1) Plot the data for these five years on the following graph. **Note**: You will not be graded on how you plot the points, but plotting the points accurately on the graph will help you examine the relationship between unemployment and inflation during this period and solve the problems that follow.

2) Which of the following statements most accurately describes the relationship between inflation and unemployment in the United States during this time period? [Hint: assume 1974-1975 data points help the formation of a short-run Phillips curve in the first stage.]

A. The short-run Phillips curve shifted to the right after actual inflation was higher than expected.
B. The short-run Phillips curve shifted to the left after actual inflation was lower than expected.
C. The short-run Phillips curve remained stable.

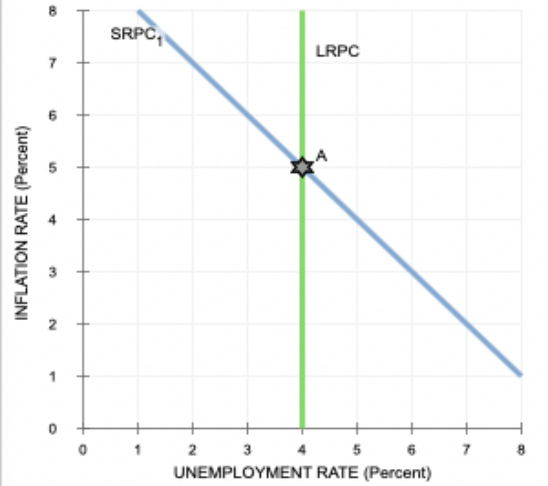
3) The left graph below shows the short-run Phillips curve (SRPC) for the United States in 1974. Shift the curve to illustrate what happened between 1974 and 1978.



4) The right graph above shows the aggregate demand (AD) and short-run aggregate supply (AS) curves for the United States in 1974. Shift the aggregate supply curve to approximate what happened between 1974 and 1978.

6. Expectations and the Phillips curve [Extra Credit: 1 point]

The following graph plots the long-run Phillips curve (LRPC) and short-run Phillips curve (SRPC1) for an economy currently experiencing long-run equilibrium at point A.



1) Which of the following is true along SRPC1?
   A. The expected inflation rate is 5%.
   B. The actual unemployment rate is 6%.
   C. The actual inflation rate is 5%.
   D. The natural rate of unemployment is 3%.

2) Suppose that the central bank for this economy suddenly and unexpectedly decreases the money supply in an effort to reduce inflation. As a result of this unanticipated policy action, actual inflation falls to 3%. On the previous graph, use the black point (plus symbol labeled "B") to illustrate the short-run effects of this policy.

3) Suppose that now, after a period of 3% inflation, households and firms begin to expect that the inflation rate will persist at the level of 3%. On the previous graph, use another line to draw SRPC2, the short-run Phillips curve that is consistent with these expectations, assuming that it is parallel to SRPC1. Finally, using a new point, indicate on the previous graph the new, long-run equilibrium for this economy.

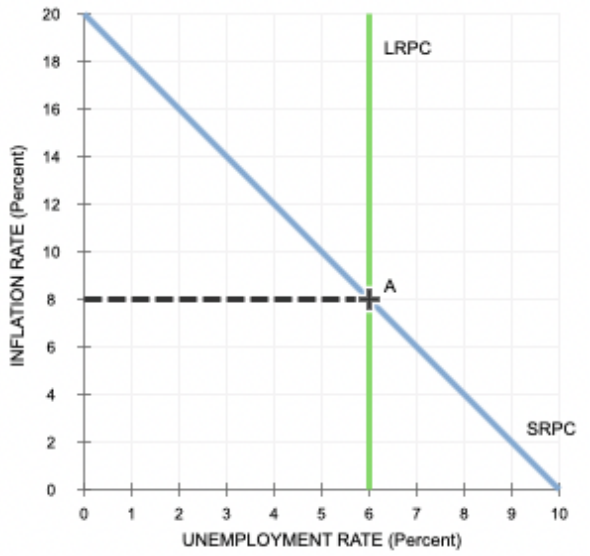
3) The inflation rate at point C is _____ the inflation rate at point A, and the unemployment rate at point C is _____ the unemployment rate at point A.

4) Was the central bank able to achieve its goal of lowering inflation?
   A. No, because the central bank cannot affect the inflation rate through monetary policy.
   B. Yes, but only in the short run; in the long run, inflation returned to its natural rate.
   C. Yes, the central bank's policy successfully reduced inflation in both the short run and the long run.

5) Now, suppose that the public fully anticipates the central bank's decision to decrease the money supply. Assume the public also believes that the monetary authority is firmly committed to carrying out this policy. According to rational expectations theory, when the economy is in long-run equilibrium, a fully anticipated decrease in the money supply will cause the economy to move_____ on the previous Phillips curve graph. In this case, rational expectations theory predicts that the fully anticipated decrease in the money supply will have the immediate effect of _____ in the inflation rate and _____ in the unemployment rate.

7. The costs of disinflation [Extra Credit: 0.5 point]

The following graph plots the short-run and long-run Phillips curves (SRPC and LRPC, respectively) for an economy currently experiencing long-run macroeconomic equilibrium at point A, where the natural unemployment rate is 6% and the inflation rate is 8% per year.



1) Suppose that the central bank for this economy has decided that inflation is too high and thus wants to decrease the inflation rate by 6 percentage points per year. A reduction in the rate of inflation is known as _____. To reduce inflation from 8% to 2% in the short run, the central bank would have to accept an unemployment rate of _____.

2) True or False: If people have rational expectations, the sacrifice ratio could be much smaller than suggested by the short-run Phillips curve. Explain.