1.   Suppose that the IS curve is given by

$$-.6\hat{Y} = (R\text{-}R^*) ,$$

the Phillips Curve (or price adjustment (PA)) line is

$$\pi = .4\hat{Y}_{-1} + \pi_{-1} + Z,$$

and the Fed's Taylor rule is

$$r = \pi + .4\hat{Y} + .5(\pi\text{-} \pi^*) + R^* ,$$

where $\hat{Y}$ is the GDP gap, r is the nominal interest rate, π is the inflation rate, π^* is the target inflation rate, and R^* is the equilibrium real interest rate.

a. Derive (algebraically) the macroeconomic policy (MP) curve.

b. If the inflation rate π is equal to the target inflation rate π^*, what is the GDP gap $\hat{Y}$?

c. Starting from potential GDP with $\pi = \pi^* = 2$ percent, the Fed increases the target inflation rate π^* to 3 percent. Show (graphically) the effects on inflation and the GDP gap.

2.   Suppose that the Phillips Curve is given by

$$\pi = .3(Y_{-1} - Y^*)/Y^* + \pi_{-1} + Z ,$$

and the macroeconomic policy (MP) curve is

$$(Y_{-1} - Y^*)/Y^* = -2(\pi_{-1} - \pi^*) ,$$

with potential output $Y^* = \$2,000$ billion and the target inflation rate $\pi^* = .03$ (3 percent).

a. Derive (algebraically) the equation that describes inflation. Does the equation favor unemployment or price stability?

b. Suppose the economy starts out at potential output with the inflation rate equal to the target inflation rate. Show (graphically) the path of the economy following a positive shock Z that initially increases inflation.