The Basic Dynamic AS Model:

1. Consider the IS-LM model with our basic Dynamic AS price adjustment model (see my handout) and adaptive expectations.
   a. True, False, Explain: According to the IS-LM model, a 10% increase in the nominal money supply (M) will cause the aggregate demand (AD) curve to shift vertically upward by 10%.
   b. True, False, Explain: In the IS-LM/Dynamic AS model, a once and for all 10% increase in the nominal money supply will cause prices to rise 10% in the long run.
   c. True, False, Explain: In this model, a permanent increase in the rate of growth of the nominal money supply by 10 percentage points will cause the rate of inflation to rise by 10 percentage points in the long run.
   d. If the model described the U.S. economy accurately, would you expect inflation to be a purely monetary phenomenon (i.e., determined purely by the money supply) in the long run? What about in the short run?
   e. Suppose that the economy goes into a recession because of an exogenous fall in spending (e.g., consumers and businesses grow less confident and cut C and I). Explain the tradeoff between unemployment and inflation faced by the Fed in this case, according to the model.
2. Recall Problems and Applications **3g** from Chapter 12. In that problem, we had[1]

   IS: $$Y = 3000 - 200\,r$$
   LM: $$Y = \frac{M}{P} + 200\,r$$

   Thus, we could have written AD as a function of the nominal money supply as follows

   AD: $$Y = 1500 + \frac{M}{2\,P}$$

   The price level P in that problem was given to be 3, and M was 3000. Thus short run equilibrium output was 2000 (confirm this with AD above). Now suppose that the natural rate of output $\bar{Y}$ is also 2000, and that price adjustment over time is given by the basic Dynamic AS model with adaptive expectations:

   Dynamic AS: $$\pi_t = \mathrm{E}_{t-1}\pi_t + 0.05 \cdot (\mathrm{E}_{t-1}Y_t - \bar{Y}) + v_t$$
   Adaptive Expectations: $$\mathrm{E}_{t-1}\pi_t = \pi_{t-1}$$
   $$\mathrm{E}_{t-1}Y_t = Y_{t-1}$$

   Suppose that the price level P has been 3 for some time, so that both actual and expected inflation have been zero, and output Y has been at it's natural rate $\bar{Y} = 2000$, for some time. Assume further that v_t is zero unless otherwise specified.
   a. Explain the price adjustment assumption above.

[1] See Help With Practice Problems 5, p. 4. Here I have left M variable.

b. Suppose that the Fed decides (in the current year) to raise the nominal money supply M by 10%, to 3300. Calculate the effect on P and Y for the current year and for next year.

c. What will happen to P, Y and π in the long run?

d. Could the Fed keep $Y = 2050$ for each period following the increase in M by changing M in each successive period (don't calculate numbers)?

e. Ignore parts **b - d**. Suppose that, contrary to our assumption of adaptive expectations, expected inflation for next period rises from 0 to a positive number, 5%, due to false rumors that the Fed is going to ease monetary policy. Suppose that there are no future rumors, and so expected inflation returns to being adaptive (i.e., follows $E_{t-1}\pi_t = \pi_{t-1}$) in all subsequent periods.

   What is the qualitative effect of the rumor on next period's GDP? can the Fed keep GDP from changing in all periods, by manipulating the money supply over time, without producing a long run increase in inflation?

f. Now suppose that falling import prices, resulting from an increase in the value of the U.S. dollar, put downward pressure on the domestic inflation rate. Specifically, this shows up in the model as a one-time negative price shock (v) of -5% for the current period.

   Can the Fed stabilize GDP and lock in the lower inflation rate at the same time?

Ch. 15: Extended Model of Dynamic AD and AS (DAD and DAS)

3. Questions for Review 1-4 (p. 469).

4. Consider the extended dynamic AD and AS model in Ch. 15. Suppose that the central bank follows a monetary policy rule with parameter $\theta_\pi = 0.5$ and that the economy is initially in long run equilibrium with $Y = \bar{Y}$ and $\pi = \pi^* = 2$. Now suppose that in period 1, there is a 25% price shock so that $v_1 = 25$. Explain why, according to the model, output will fall in period 1 as a result of the price shock. Will the rate of inflation π_1 be greater than, less than, or equal to 27% in period 1? Will the inflation rate rise or fall from period 1 to period 2 (assuming that $v_2 = 0$)?

5. Consider the extended dynamic AD and AS model in Chapter 15. Suppose that the Fed's inflation target is 2% ($\pi^* = 2$) and that the economy has been in long run equilibrium for some time with $\pi = \pi^*$ and $Y = \bar{Y}$. Now suppose that the Fed *incorrectly* believes that potential output has risen. I.e., the true level of potential output is still $\bar{Y}$, but the Fed now thinks that it is a larger number $\bar{Y}^*$. Consequently the Fed now uses the incorrect value $\bar{Y}^*$ in its interest rate setting rule. Note that this will shift the DAD curve in the current period (which way)? Then what should happen to the inflation rate over time if the Fed does *not* discover its error?