Monetary Policy

1. Suppose that, in the model we have been studying in class, instead of following a monetary policy of $M \equiv \overline{M}$, the government follows a policy of $M = \overline{M}e^{mt}$, for some fixed money growth rate m. How does this affect the existence of a constant-velocity steady state? Does it affect the claim that the constant-velocity steady-state is unstable, so that any other candidate equilibrium must have $v \to \infty$ or $v \to -\infty$? (Note: You are likely to find that there are bounds on the range of values of m that are consistent with steady state and/or that are consistent with the steady state being unstable, and hence at least potentially unique.) Consider both the $f(v) = v$ and the $f(v) = v/(1+v)$ cases.

2. Suppose policy is to set $M \equiv \overline{M}$ for $0 \le t < 1$, $M \equiv 2\overline{M}$ for $t \ge 1$, and that the public knows about this in advance. Assume $f(v) = v$, $g = .02$, $b = .05$, $Y \equiv 1$, and that fiscal policy is passive, so it does not affect price level determination. Note that for $t \ge 1$, we will be in the steady-state with constant v that was discussed in class. Before that, though, v will not be constant. This is a fairly demanding computation. There are two possible approaches. One is to solve the differential equation derived in class for v analytically, using partial fraction expansion. The other is to use a numerical differential equation solver, like Matlab's `ode23` or `ode45`, to solve numerically. Using either approach, you will have to recognize that what you know is velocity at $t = 1$, not initial velocity, so that you will be solving "backward" in time in comparison to the standard problem with given initial conditions.