Econ 200A

Answers to Problem Set #2, Questions 4 and 5

4.

a. Permanent technology shocks are not easy to imagine (relative to positive tech. shocks). I suppose Y2K (if it was as bad as people feared it would be) could have been one, or a nationwide virus that locks up all the systems could be one. Sometimes, macroeconomists also think of a devastating natural disaster that destroys physical capital as a negative tech. shock as well.

b. This means now we produce less with the same amount of \( k \). We can look at the formulae to find out how curves are affected.

For the \( \Delta C=0 \) curve, the marginal product should still equal the same value

\[
F'(k_{t+1}) = \delta + \theta
\]

which means that the new \( k \) that satisfies this condition will be lower than the old one. Thus, the \( \Delta C=0 \) curve shifts left as a result.

c. For the \( \Delta k=0 \) curve, we have the following equation

\[
F(k_t) - C_t = \delta k_t
\]

and with a new production function, we need a lower \( k \) for this to hold. Thus, \( \Delta k=0 \) curve shifts down.

d. When the change occurs, consumption will jump down to the new saddle path. Change in capital will start next period since depreciation will start eating up capital next period.
5.

An increase in $\theta$, the discount rate, will only shift one curve since it only enters the equation of the $\Delta C = 0$ curve. Increase in $\theta$ should drop the equilibrium $k$, giving us the following graph:

![Graph showing the effect of an increase in $\theta$ on the $\Delta C = 0$ and $\dot{k} = 0$ curves.]

So, since households are valuing current consumption more now, consumption jumps and then it heads towards the new equilibrium on its new saddle path. At the new equilibrium, both $c$ and $k$ are lower than their original values.