Required Assignment #3

Textbook Questions
* denotes graded questions

Chapter 8 (p. 204): Problem 8*, 12*

8. a. See the blue line.

b. With higher wealth, the quantity of saving will decrease at every interest rate. Thus, the saving supply curve shifts leftward. See the pink line.

12 a. Potential GDP would decrease.
A severe drought that brought a fall in productivity would decrease the demand for labor. The equilibrium quantity of labor would decrease. Full employment would decrease and potential GDP would decrease.

b. Employment would decrease.
A severe drought that brought a fall in productivity would decrease the demand for labor. The equilibrium quantity of labor would decrease.

c. The real wage rate would fall.
When the demand for labor decreases, there is a movement down the supply of labor curve and the real wage rate falls.
Chapter 9 (p.225): Problems 2*, 4

2. No. The economy conforms to a one-quarter rule.
   In this economy, an $x$ percent increase in the capital stock per hour of work leads to a $0.25x$ percent increase in real GDP per hour of work. You can confirm this fact by calculating the percentage change in capital and real GDP at each of the levels provided in the table and then dividing the percentage change in real GDP by the percentage change in capital. For example, when capital increases by 100 percent from $20$ to $40$, real GDP increases by 25 percent from $6.00$ to $7.50$. Or, when capital increases by 50 percent from $40$ to $60$, real GDP increases by 12.53 percent from $7.50$ to $8.44$.

4. a. Yes.
   Diminishing returns are present if the marginal product of capital diminishes as capital increases, holding technology constant. You can calculate the marginal product of capital from the schedule provided. For instance, a $20$ increase in capital from $20$ to $40$ increases real GDP per hour by $1.50$. A further $20$ increase in capital from $40$ to $60$ increases real GDP per hour of work by less, only $0.94$. The return to capital does, indeed, diminish.

   b. $2.11$ or $1.76$, depending on method.
   Using the one-quarter rule from problem 2, the increase in productivity caused by the increase in capital is equal to one quarter the percentage increase in capital. The capital stock increases by 100 percent from $60$ to $120$, so the one-quarter rule tells us that the increase in capital increases real GDP by 25 percent or $2.11 (=8.44*0.25)$. 
   Using the numbers in the table for question 2, it is possible to calculate that real GDP per hours of labor would have been $10.20$ in 2001 if there had been no change in technology. Thus, the change in real GDP per hours of labor that is due to capital accumulation is $1.76 (=10.20-8.44)$.

   c. $2.19$ or $2.54$, depending on answer in part b.
   The total change in real GDP per hour of work is $4.30$. If $2.11$ is the result of capital growth, the remainder, $2.19$, is the result of technological change. If $1.76$ is the result of capital growth, the remainder, $2.54$, is the result of technological change.

Chapter 10 (p.255): Problems 2*, 8

2. Of the list, money in the United States includes the checking deposits at Citicorp, an American Express traveler’s check, and NOW accounts. The checking deposits at Citicorp and the NOW accounts are deposit money. The three money assets meet all the functions of money. Yahoo! stock and stat of Florida securities are not money. While Yahoo! stock and state of Florida securities are stores of value, they are definitely not a mediums of exchange and so are not money.

8. a. The initial increase in the quantity of money in the United States is $1
million. Money is equal to bank deposits and currency outside the banks. Deposits increase by $1 million, so the initial increase in the quantity of money is $1 million.

b. The initial increase in the quantity of bank deposits is $1 million. Deposits increase by $1 million because the thief places all the new money on deposit.

c. The bank lends out $950,000. The bank has a new deposit of $1 million and it must keep 5 percent of it ($50,000) as reserves and lends the rest ($1,000,000 minus $50,000), which equals $950,000.

d. The thief’s bank has loaned $950,000. In the absence of currency drain, this amount returns to the banking system as a deposit. Again, the bank will keep 5 percent, $47,500, in reserves and will lend a further $902,500. The process will continue with the amount loaned out and deposited getting smaller at each step due the requirement to keep 5 percent of a deposit backed by reserves. Eventually, the amount being deposited becomes trivially small. The cumulative effect is that $19 million is lent out and there is $19 million in new deposits created above and beyond the initial deposit of $1 million. This can be calculated by noting that the total increase in deposits depends on the proportion \( L \) of deposits that banks lend out. The total effect of new reserves on deposits is \( 1/(1-L) \), which is \( 1/(1-0.95) \), or 20. When reserves increase by $1,000,000 and the required reserve ratio is 5 percent, deposits will increase by 20 times $1,000,000, which is $20,000,000. This means that, given the initial injection of $1 million new deposit into the banking system, the banking system has created $19 million in new loans and new deposits.

e. The quantity of money has increased by $2,852,500. The first loan is $950,000, which increases the quantity of money by $950,000. When this money is spent and returned to the bank as a deposit, the banks keep 5 percent of it ($47,500) as reserves and lend out the rest ($902,500). The loan will be deposited, so in this round, the banks create $902,500 of new money. So, after 2 loans, the quantity of money has increased by $1,000,000 + $950,000 + $902,500, which equals $2,852,500.

f. The quantity of money increases by $20,000,000. Deposits increase by $20,000,000. Loans increase by $19,000,000.

Chapter 11 (p.276): Problem 10*

10. a. The quantity of money decreases because deposits decrease.

b. Aggregate demand decreases.

c. In the short run, the decrease in aggregate demand causes the price level to fall and real GDP to decrease.

d. In the long run, real GDP returns to potential GDP and the price level is lower than it otherwise would have been by the same percentage as the percentage decrease in the quantity of money.