Problem 1. Which of the following will be included in 2009 GDP?

(a) The value of a bookshelf that you build for yourself in 2009

(b) The value of a boat that is produced in 2008 and sold in 2009

(c) The value of a textbook that is produced in 2009 but not sold

(d) The value of a used car that is sold in 2009

(e) None of the above

Answer 1: c.

(a) If you build it for yourself and don't sell it on the market, then it is not included in GDP. Note that household goods that were intended for sale but could not be sold are *not* considered inventory investment and therefore do not contribute towards GDP. In other words, only firms can "buy it from themselves."

(b) If it's not produced in 2009, then it's not included in 2009 GDP

(c) Something produced in 2009 and not sold is still considered part of 2009 GDP – they "buy" it from themselves at the market value.

(d) A used car is not a final good so it is not included in GDP.

Problem 2. Which of the following will NOT be included in 2009 GDP?

(a) The value of lawn mower engines that Briggs and Stratton made in 2009 but could not sell.

(b) The value of a computer chip produced in 2009 and used in the production of a personal computer.

(c) The value of a piece of land Brad sold to Abe in 2009.

(d) The value of a computer chip produced in 2009 that was not used in any personal computer.

(e) None of the above

Answer 2: c. Land is considered an asset, and an asset is not the result of production. Therefore it is not considered part of GDP in any year.

Problem 3. *True or False?* If the amount of physical capital increases, demand for labor will increase if capital is substitute for labor.

Answer 3: False. If capital is a substitute for labor, then labor can be replaced with machines (hence the word substitute). There is less demand (down/left) for workers.

Problem 4. *True or False?* If a labor-saving technological progress takes place, demand for labor will shift to the left.

Answer 4: True. Labor-saving technological progress means the same amount of stuff can be produced with fewer workers. Hence the demand for workers falls. This means the demand curve for labor shifts to the left.

Problem 5. *True or False?* An increase in the amount of complementary capital will cause a movement along the demand-for-labor function.

Answer 5: False. Complementary capital means the capital makes workers even more productive, i.e. their MPL increases. This means the entire labor demand curve will shift up/right as firms want to hire more workers now that they're more productive.

Problem 6. What are the sources of frictional unemployment?

Answer 6. First is **search frictions**. When you graduate, you'll have to go on a bunch of job interviews and stuff before you actually land a job. So even though the jobs are out there, it'll take a little bit of time. Therefore you will be unemployed while you search for the right job.

Next is a **sectoral shift**. This means industries change in such a way that people lose their old jobs and need to find a new, similar job. A VCR technician loses their job and needs to find a job as a DVD technician. Then the DVD technician loses their job and needs to find a job as a Netflix technician.

Or if an industry moves to a different part of the country, then the person is unemployed due to a sectoral shift unless they move to the new location of the factory.

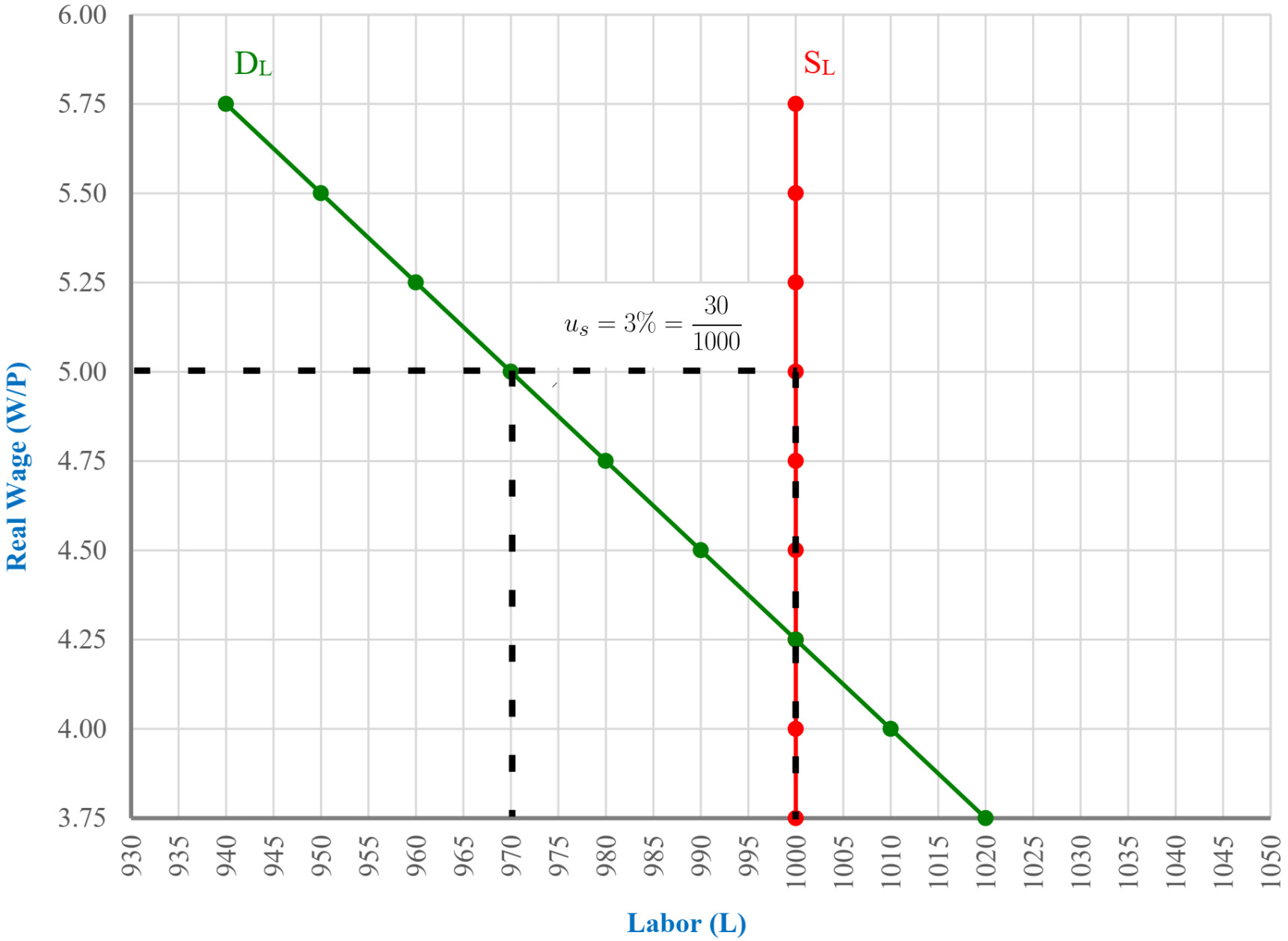
Problem 7. What are the sources of structural unemployment?

Answer 7. First is **minimum wage laws**. A minimum wage law dictates that a firm must charge a wage above a certain threshold. In practice this means that sometimes firms are forced to pay a wage that is higher than the equilibrium real wage. This generates structural unemployment.

Second is **efficiency wages**. Sometimes a firm might choose to offer a real wage higher than the equilibrium real wage in order to inspire workers to work harder, or to attract more skilled workers. The high real wage, however, leads to structural unemployment.

Finally, **labor contracts**. Wages are usually fixed over certain time intervals by contracts. This means if the equilibrium real wage goes down, but the labor contract fixes the real wage, then the real wage is above the equilibrium and structural unemployment is generated. Similarly, unions might bargain for labor contracts that pay a real wage above the equilibrium real wage.

All of these scenarios are illustrated in the graph on the next page where there are 30 structurally unemployed workers.


6.00
5.75
5.50
5.25
5.00
4.75
4.50
4.25
4.00
3.75
Real Wage (W/P)
DL
SL
$u_s = 3\% = \frac{30}{1000}$
930
935
940
945
950
955
960
965
970
975
980
985
990
995
1000
1005
1010
1015
1020
1025
1030
1035
1040
1045
1050
Labor (L)

Problem 8. What is the source of cyclical unemployment?

Answer 8. In the short run, prices and wages are sticky. In other words, if there is some kind of economic disturbance, then prices and wages cannot instantaneously adjust so that W/P remains exactly at its equilibrium level. In practice, wages are stickier than prices.

Suppose there is a *negative demand shock*; for instance, the stock market crashes, everyone feels poorer, and so people start buying less stuff. Firms respond to this by lowering their prices so they can actually sell their stuff again. They probably want to cut wages too: their revenue has gone down from lowering their price, and cutting their costs will allow them to retain their profit.

Problem is, wages are largely set by contracts and union rules, so wages on average cannot be cut very much in the short run. If prices fall by 25% and wages only fall by 10%, then the new real wage is

$$\frac{0.90W}{0.75P} > \frac{W}{P}.$$

In words, the denominator falls by a larger percentage than the numerator, so the whole ratio increases. That means the real wage rises above the equilibrium real wage and the consequence is more jobs wanted than jobs available.

Problem 9. In a country, the overall rate of unemployment is 3 percent. The frictional rate of unemployment is 1 percent and the structural rate of unemployment is 4 percent. The potential GDP in this country equal $Y_P = 100,000$ units. Moreover, economists have estimated the Okun's alpha to be $\alpha = 1.50$.

In this country, then, the cyclical rate of unemployment equals _____ percent and the real GDP equals _____ units.

Answer 9. Because $u = u_n + u_c = (u_f + u_s) + u_c$, we have

$$3\% = 1\% + 4\% + u_c \quad \Longrightarrow \quad u_c = 3\% - 5\% = -2\%.$$

Then current real GDP satisfies

$$\frac{100,000 - Y}{100,000} = 1.50 \times -0.02\% \quad \Longrightarrow \quad Y = 103,000.$$

Note that GDP is above potential GDP. This is equivalent to having a negative cyclical unemployment rate.

Problem 10. Define a **recession** and an **expansion**.

Answer 10. When real GDP decreases in the short run, it is called a recession. When GDP increases in the short run, it is called an expansion. The point where the recession turns into an expansion is called a *trough*; and the point where an expansion turns into a recession is called a *peak*.