Sketch Answers to Problem Set #2

1) Value of cotton produced = Price * Quantity
    = $250 * 950,000 tons of cotton = $237,500,000
   Value of cotton per worker = 237,500,000/2,000,000 = $118.75 per worker (per yr)


2) $118.75 = (2/3) * T$ T = total revenue produced by slaves
        $118.75*(3/2) = T$
        $$178.12 = T$

3) Note: Remember we are assuming that the price of a good = the expected value
        Professor DeLong tells us:
            Cost of slave = $1,000
            Cost of slave = 10 years surplus
        Therefore, the surplus per year = $1000/10 = $100

        In Q2 we determined that a slave generated $178.12 per year in revenue
        Therefore surplus/revenue = 100/178.12 = 56%

4) There are 2 million slaves in the labor force. At $100 per slave that is
   $200,000,000.

5) No question

6)
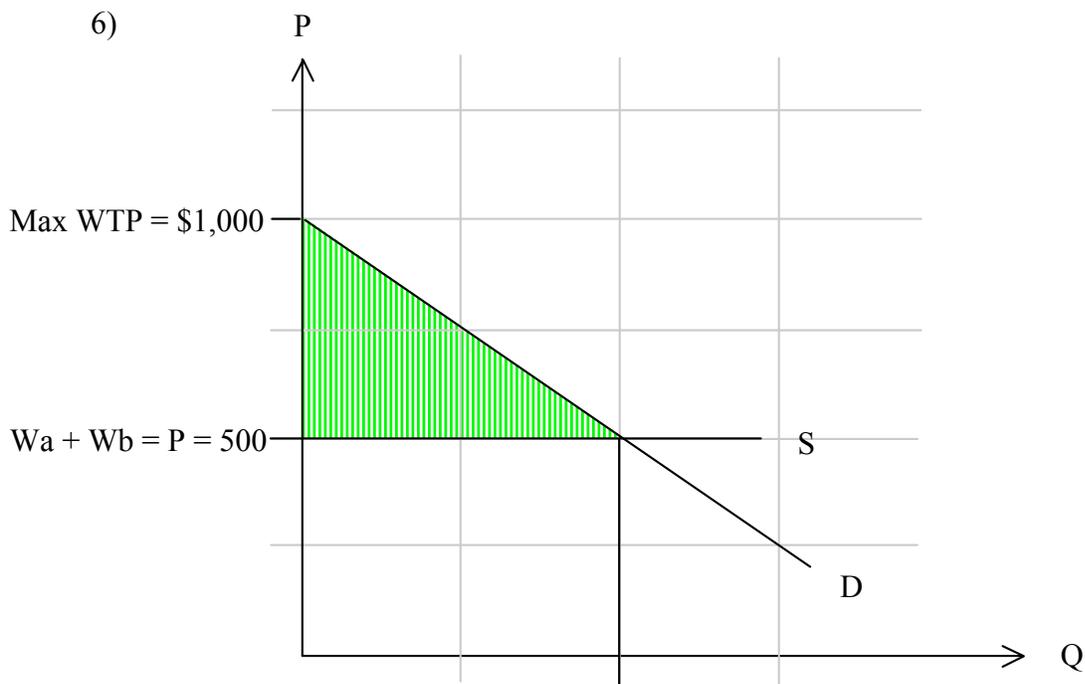
a. First, draw the supply and demand curve (remember because we assume a competitive market, in this example we have a horizontal supply curve). Now identify consumer surplus – it is the triangle above the supply curve and to the left of (below) the demand curve.
b. The area of a triangle is 0.5*base*height. So to figure out consumer surplus you need to know the height of the triangle and the base. Use the information Prof. DeLong gives you in the problem to fill these in and then calculate the area of the triangle.
c. Getting the height of the triangle:
    i. "$1000 is the price the most eager buyers will pay" – this translates into the highest price for which any quantity of cotton could be sold. That is the price where the demand curve intersects with the y-axis.
    ii. We know that producers will supply any amount as long as their costs are covered. Their costs are $Wa + Wb = 250 + 250 = 500$. Therefore the horizontal supply curve intersects the y-axis at a price of 500.
    iii. We now have all the information we need to get the height of the triangle it is $1000 – 500 = 500$.
d. Getting the base of the triangle:
    i. We know that the left corner of the triangle is 0, so we just need the right point.
    ii. The right point is the equilibrium quantity when p=500 (the quantity at which the supply and demand curves intersect when p=500). We assume that the market clears and that producers only produce as much as consumers are willing to buy. Therefore, if the quantity produced in 1850 is 950,000 tons, that must be how much consumers wanted when p = 500 (i.e. the point where the supply and demand curves intersect).
    iii. We now have everything we need to calculate the base of the triangle it is: $950,000 – 0 = 950,000$.
e. Now we can calculate the area of the consumer surplus triangle
    $0.5*base*height = 0.5*950,000*500 = 237,500,000$