Final Exam - *Answers*
August 15, 2002

Answer all questions, in blue book. Plan ahead and budget your time. The questions are worth a total of 90 points, as indicated. You will have 120 minutes to complete the exam.

1. [18 points] The figure on the next page shows domestic demand and supply curves for a country. (The same figure appears twice on the page, for your convenience.) Use them, together with the grid for measuring prices, quantities, and areas, to give numerical answers the questions below, assuming that
   - The world price of the good is $8 per ounce.
   - The country is small.
   - When it initially trades, the country levies a tariff on imports of $4 per ounce.

   You should show your work if you want a chance for partial credit for wrong answers.

   a. (2 points) What is the country's autarky price?

      Equals price at intersection of domestic supply and demand: $18.

   b. (4 points) With trade and with the $4 tariff, what is the domestic price, and what quantity does the country import?

      Domestic price equals world price plus tariff: $8 + 4 = $12. At that price, reading off the figure, domestic supply is 10 and domestic demand is 19, so imports are 19-10 = 9.

   c. (8 points) Suppose that the size of the tariff is increased from $4 to $8, the world price remaining unchanged. Find the following changes that are due to this tariff increase (you are *not* comparing here to free trade, but rather to the initial situation with the $4 tariff):

      Price rises to 8+8 = $16; supply rises to 14 and demand falls to 17, so imports fall to 3

      i. The change in welfare of suppliers.
         Area "a" = +$48
      ii. The change in welfare of demanders.
         Area –"a+b+c+d" = –$72
      iii. The change in tariff revenue.
         Area "c+f" minus "e+f+g" = "c–(e+g)" = 12–24 = –$12
      iv. The change in welfare of the country as a whole.

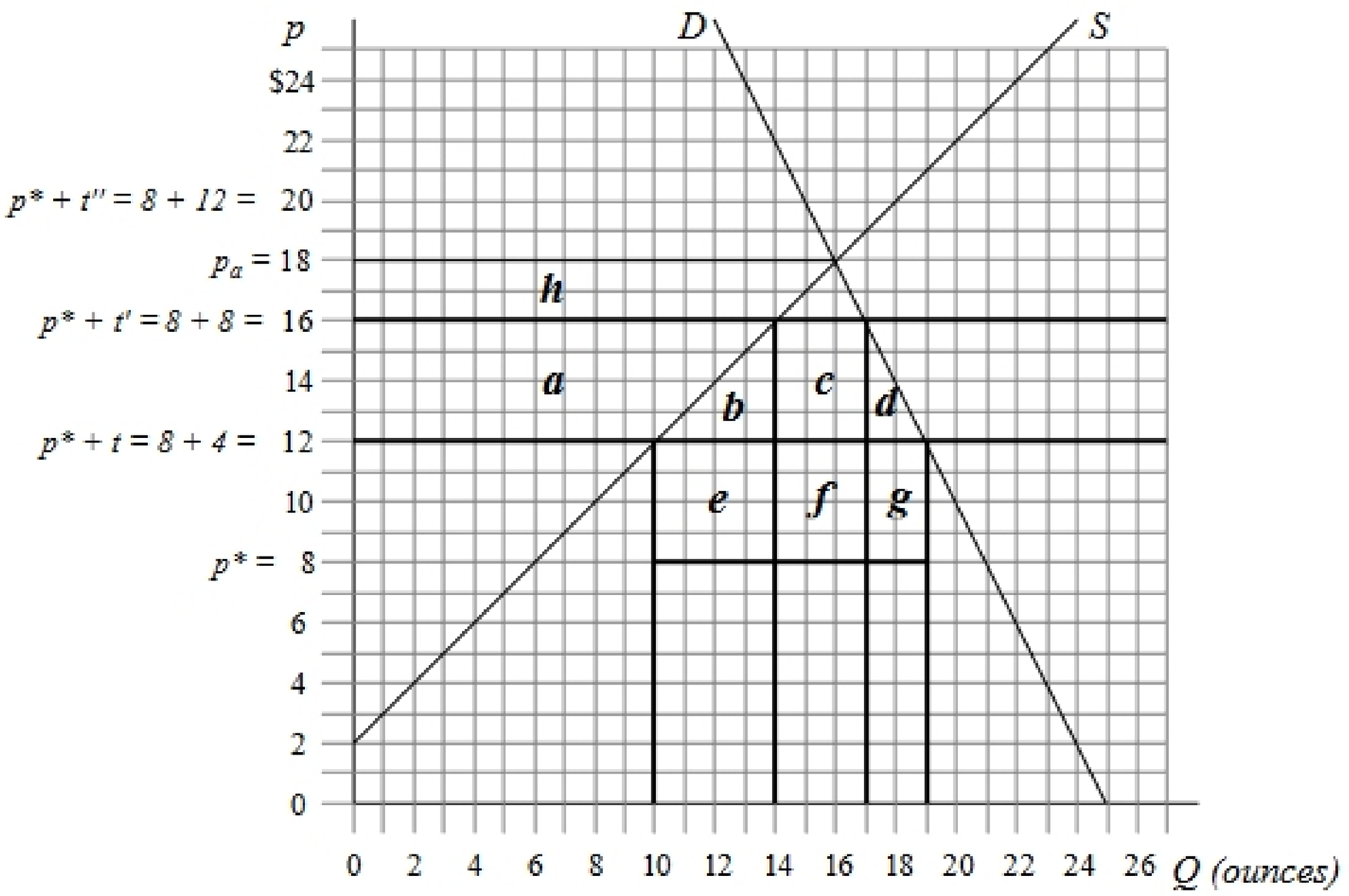
Sum of the above = 48–72–12 = –$36

d. (2 points) Suppose that in part (c) the new tariff had been $12 instead of $8. What would the change in welfare of suppliers (compared again to the initial $4 tariff) have been in that case?

Imports are now available only for 8+12=$20, which is above the autarky price. At a domestic price of $20 there would be excess supply of the good, and the market would not clear, since suppliers cannot sell abroad for more than $8. Therefore the tariff is "prohibitive," and the domestic price rises only to its autarky level, $18. The change in welfare of suppliers is therefore "a+h"=+$78

e. (2 points) Suppose that the country were to replace its tariff with a quota permitting imports of 6 ounces of the good. What would be the tariff equivalent of that quota?

Domestic price must now rise to a level such that the demand for imports (domestic demand minus domestic supply) equals exactly 6 ounces. From the figure, that occurs at price $14, where supply is 12 and demand is 18. The tariff equivalent is the difference between this domestic price and the world price: 14–8=$6.



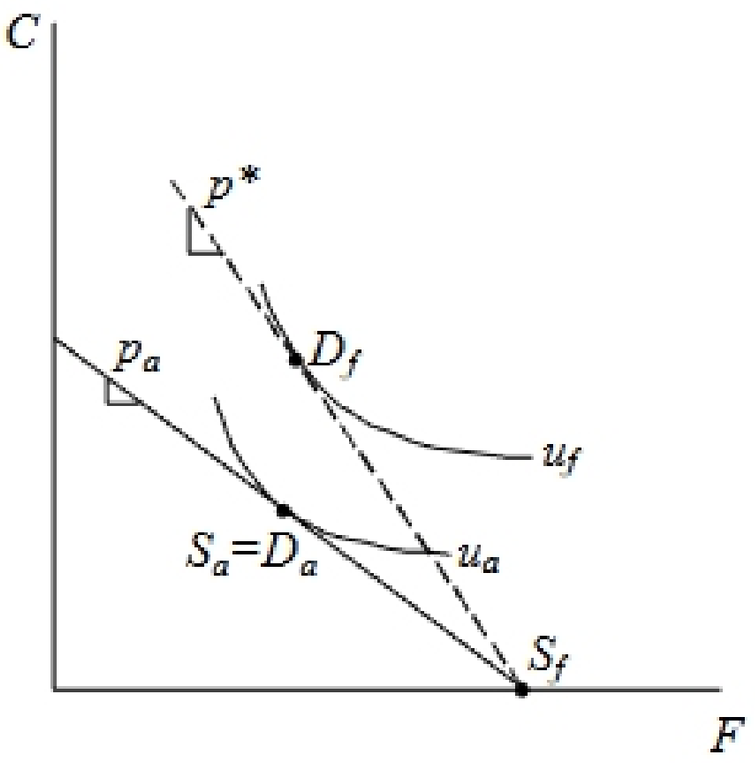
2. [24 points] Consider a small economy, initially in autarky, in a world where there are two goods that can be produced, food and cloth. The relative price of food in the country in autarky is lower than the relative price of food on the world market. Suppose that the country now opens to free international trade. Then for each of the models listed below, answer the following questions, showing the reasoning behind your answers.
   - How will trade change the fraction of the labor force that is employed in the food sector?
   - How will trade change the real wage of labor that was initially employed in the food sector?
   - If non-distorting transfers were possible and used within the country, would it be possible for trade to benefit everybody in it? And if so, to whom would such transfers have to be given?

In all of the models, the autarky relative price of food is (minus) the slope of the PPF at the autarky equilibrium, where supply and demand are equal (S_a=D_a), in a diagram with food on the horizontal axis and cloth on the vertical. When the country opens to free trade at a world relative price of food that is greater than this (a steeper price line, with slope p), production moves, if necessary, to a tangency of the PPF with this new price line, and consumption moves to a tangency of an indifference curve with this price line.*

a. The Ricardian Model

Production moves from S_a to S_f, with the country completely specializing in food. Thus all labor that was not already in the food sector moves there, and the fraction of employment there expands to 100%.

Labor in the food sector continues to be paid the value of its marginal product, which in the Ricardian model does not change. So w/p_F is unchanged. However, since $p=p_F/p_C$ rises, $w/p_C=(w/p_F)(p_F/p_C)$ rises, and the real wage of labor in the food sector goes up.



Welfare of the country rises from u_a to u_f, which means that it is possible for everyone to be made better off with non-distorting transfers. In fact, in this model, since everyone earns income only from labor, nobody will lose even without such transfers, so no transfers have to be given.

b. The Extreme Specific Factors Model (all factors immobile)