I have neither given nor received unauthorized aid on this examination, nor have I concealed any similar misconduct by others.

Signature__________________________________________

Part 1 (2 points each – circle all that apply)

1. An fixed trade cost is ____
   a. assessed per-unit
   b. assessed as a percentage of production value
   c. assessed when trade is above zero
   d. None of the above

2. What changes did Ben and Jerry’s make to their product upon entering the Japanese market?
   a. Larger Sizes
   b. More sugar
   c. Different flavors
   d. No Ben and Jerry on label

3. Containerization _____
   a. Is common in air transport.
   b. Is used by tramp shipping.
   c. Reduced shipping costs by 10%.
   d. Can be used by rail shipping.

4. After signing the Canada-US Free Trade Agreement, what happened in Canada?
   a. Employment rose
   b. Productivity rose
   c. ‘a’ and ‘b’
   d. None of the above

5. Liner shipping can be appropriately characterized by which characteristics?
   a. No defined port of call
   b. Bulk commodity shipping
   c. Use of containerization
   d. None of the above
Part 2: (10 points each)

1. When discussing Bernard, Jensen, Redding, and Schott, we referred to exporting being concentrated. What evidence was presented in paper to support this assertion?  

   +3  
   +4

Only 11% of firms ship 5 or more products to 5 or more destinations. However, these firms export over 90% of the value of trade from the US, and employ 68% of all workers that are involved in exporting.  

   +3

2. Please briefly discuss three ways that the Krugman model differs from the standard trade model.  

   Krugman has:  
   Love of variety +3  
   Monopoly power in varieties +4  
   Fixed costs of entry +3
3. In the Krugman model, firms produce each unit of a variety with one unit of labor. Thus, if the firm produces $q$ units, they hire $q$ workers to produce these units. When firms enter, they also must hire $F$ units of labor to set up their firm.

There are three conditions to the Krugman model. For the first, optimal pricing is characterized by $p = \frac{\sigma}{\sigma - 1}w$, where $\sigma$ is the elasticity of demand (positively defined) and $w$ is the wage. Second, firms enter until total profits (variable profits - fixed costs) equal zero. Finally, labor markets must clear, where $L$ is the total labor endowment.

Please write down the free entry condition and labor market clearing condition to solve for (1) the output per firm, $q$, and (2) the total number of entrants, $N$.

**Free entry**

First, solve for variable profits: +2

$$(p - c)q = \left(\frac{\sigma}{\sigma - 1}w - w\right)q = \left(\frac{1}{\sigma - 1}w\right)q$$

Setting equal to fixed costs +2

$$q \frac{1}{\sigma - 1}w = wF$$

Solving for $q$ +1

$$q = (\sigma - 1)F$$

**Labor Market Clearing**

Variable labor demand, $Nq$, and fixed labor demand, $NF$, should equal labor supply $L$ +2

$$Nq + NF = L$$

Substituting the equation for $q$ +2

$$N(\sigma - 1)F + NF = L$$

Solving for $N$ +1

$$N = \frac{L}{\sigma F}$$
Part 3 – 10 Points each

Consider the “Melitz” exporting model we discussed in class. A firm must decide to exit the market or operate, and if the latter, whether to be purely domestic or a domestic firm that also exports. The returns from exiting are zero. If the firm decides to operate in some manner, it must pay $F_0$ in overhead costs. If the firm also decides to export, it must pay $F_X$ in exporting fixed costs, such as up-front export financing. The firm can earn $\Pi_h(\alpha)$ in the domestic market. If the firm exports, it earns $\Pi_f(\alpha)$ in the foreign market, but loses ‘t’ percent of these profits through a foreign tariff. The term $\alpha$ is firm level productivity, where each profit function is increasing in $\alpha$.

1. Please graphically detail how firms sort into the three outcomes.

![Diagram showing three outcomes: Exit, Domestic, Exporting, with profit functions and labeled regions.]
2. Suppose that firms must pay interest on fixed costs, where overhead costs are now $F_0(1+r)$, and fixed exporting costs are $F_x(1+r)$, where $r$ is the interest rate on borrowing. Further, suppose that due to central bank operations, $r$ rises. Assuming that all three outcomes occur before and after, please detail graphically the direct effects of this change, and discuss (if any) the effect of the increase in ‘r’ on the share of active firms and exporting firms, and the average productivity of each group of firms.

Both curves shift down, but the exporting firm curve shifts down by more than the domestic curve since the interest rate affects both overhead and exporting fixed costs. Both cutoffs shift up.

*Share of active firms goes down.*  
*Productivity of active firms goes up*

*Share of exporting firms goes down.*  
*Productivity of exporting firms goes up*
3. Starting from part one of this section, suppose that the foreign government sets \( t=1 \). Please detail graphically the direct effects of this change, and discuss (if any) the effect of this change on the share of active firms and exporting firms, and the average productivity of each group of firms.

\[ \Pi_n(\alpha) - F_0 + (1-t)\Pi_f(\alpha) - F_X \]

\[ \Pi_n(\alpha) - F_0 \]

**In this question, the foreign government taxes away all export profits.** Thus, exporting incurs only fixed costs but provide no additional revenues. **Graphically, the exporting profit curve has the exact same slope as the domestic curve.**

**Thus, the share of exporting firms is zero.** There is no productivity to measure since there are no firms.

**The share of domestic firms increases, as does the average productivity of domestic firms.**