Global Economy
Midterm Test: Solutions

1. Real GDP is the sum of all value added of all firms in the economy measured at current prices.

   ***FALSE**: Real GDP measures value added using prices from a base year, not current prices.*

2. Fluctuations in measured GDP would exaggerate fluctuations in total economic activity if people do more work around the house during a recession, and less during an expansion.

   ***TRUE**: Since GDP measures only market activity and not work done at home, it will underestimate economic activity in a recession if more work outside of the market during a recession, and it will then be more accurate during an expansion when less work is done outside of the market. Therefore, the fluctuations in economic activity as measured by GDP will seem larger than they actually are.*

3. If all domestic output is exported and all domestic consumption by households and governments is imported, then domestic investment must be zero.

   ***FALSE**: We know that Y=C+I+G+X-M, the national income identity. Y=X simply implies that C+I+G=M, not I=0. Even if all consumption and government purchases is imported, it could still be the case that investment is positive, it would just have to be imported as well.*

4. For an economy that employs the Cobb-Douglas production technology, $Y=AK^{1/3}L^{2/3}$, if we see the capital-labor ratio grow from 1 to 8, and the output-labor ratio grow from 1 to 4, then it must be the case that TFP has doubled.

   ***TRUE**: The Cobb-Douglas production function can be re-scaled by dividing both sides by L to obtain $(Y/L)=A(K/L)^{1/3}$. If K/L and Y/L are both 1, then A must also be equal to 1. If K/L is equal to 8, then $(K/L)^{1/3}$ is equal to 2. If (Y/L)=4, then it must be the case that A=2. That is, TFP has doubled.*

5. If total factor productivity is constant over time, but labor and capital are both growing at the same rate, then the Cobb-Douglas production function implies that the level of output per capita will grow over time only if labor force participation grows over time.

   ***TRUE**: We know that Y/Pop=(Y/L)(L/P), where Pop is the total population and L is the size of the labor force. Therefore, if Y/L is constant over time, Y/Pop can only grow if L/P grows, that is, if labor force participation grows. A Cobb-Douglas production function with constant A and constant K/L will imply a constant level of Y/L over time (see question 4). In that case, per capita output can grow only if labor force participation grows.*

6. Savings and investment, without improvements in productivity, lead to growth that slows down over time.

<u>True</u>: Although it is true that saving and investment will lead to capital accumulation and economic growth, the diminishing marginal product of capital implies that this growth necessarily slows down over time. The Solow growth model predicts that the source of persistent growth, therefore, must be growth in TFP.

7. A decrease in productivity is good for employment since firms have to hire more workers to achieve the same levels of output.

   <u>FALSE</u>: The goal of a firm is to maximize profits, not to maintain a constant level of output. To maximize profits the firm will demand labor up to the point where the marginal product of labor is equal to the real wage. Diminishing marginal product of labor implies that at a lower level of employment implies the firm is leaving some profits unrealized, and a higher level of employment is lowering profits. Therefore, a decrease in the marginal product of labor induced by a decrease in productivity would decrease the demand for labor at a give real wage. In other words, a decrease in productivity would cause the firm to want to decrease employment.

8. Total Factor Productivity (TFP) is strictly a technological factor that has little or nothing to do with government institutions.

   <u>FALSE</u>: There are many important factors of production that we typically leave unspecified. These could be intermediate goods like energy and materials. In addition, these factors could be institutional things like the legal and regulatory environment, public infrastructure, the provision of security, or many other government institutions, that have an affect the efficient operations of the firm. Any changes in these factors will appear as a change in TFP.

9. A free trade accord with the US would only benefit Mexican workers if it resulted in an increase in their wages.

   <u>FALSE</u>: After a trade liberalization, all prices could change, not just the wage rate. If the efficiency gains from free trade induced large reductions in the prices of goods, the purchasing power of the now lower wages of Mexican workers could be greater, and they would reap a net benefit from trade.

10. Free trade raises productivity only when it allows for the transfer of technologies from efficient to inefficient countries.

    <u>FALSE</u>: Free trade eliminates the need for all countries to produce domestically all of the goods that consumers want, thereby allowing countries to specialize production and use their capital and labor resources to their comparative advantage given existing technologies. The loss in the value of inefficiently produced goods is more than offset by the gain in the value of the efficiently produced goods. The net effect is an increase in value added without an increase in the factors of production or a change in technology, consequently productivity will increase as a result of free trade.