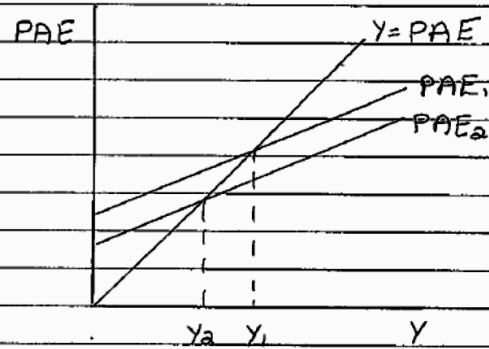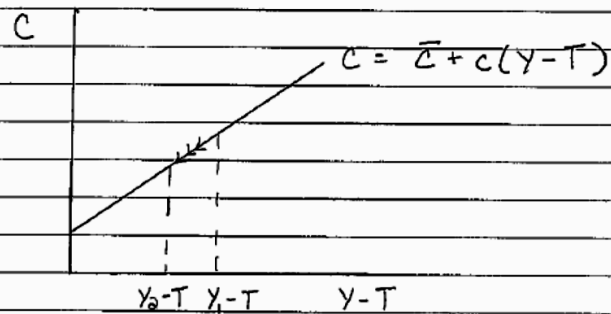SUGGESTED ANSWERS TO THE SAMPLE FINAL EXAM

1. <u>Key Tools:</u> The Keynesian cross diagram

The Consumption Function

Output falls in the short run.
Consumption also falls because Y-T declines.

Key Points:

- A cut in govt purchases lowers the expenditure line because $PAE = C + I^P + G + NX$. At a lower G, PAE is lower at a given level of Y. Y falls (from Y_1 to Y_2).

- Consumption depends on $Y-T$. The decline in $G \rightarrow \downarrow$ in $Y \rightarrow \downarrow$ in $Y-T$. So C falls.

- Though not needed for a perfect answer, it is the fall in C that multiplies the fall in G, so that the fall in Y is greater than the fall in G.

2.

Key tool : Money market diagram
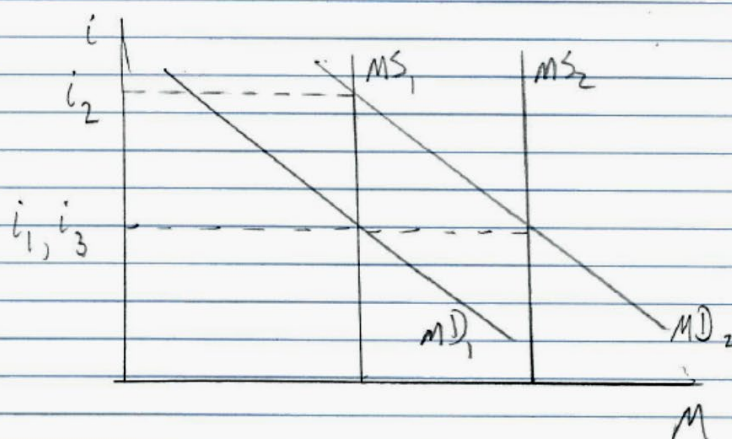
Key points:
- The fact that people want to hold more cash at a given i corresponds to a rightward shift of the money demand curve (from MD_1 to MD_2).

- If the Fed doesn't change the money supply, i will rise (from i_1 to i_2).

- To prevent this, the Fed needs to increase money supply (from MS_1 to MS_2). It needs to buy bonds.

- Concretely, the Fed needs to choose the amount of the increase to match the additional money demand at i_1. (That is, so that MS_2 intersects MD_2 at i_1).

- If the Fed does this, $i_3 = i_1$ — i doesn't change.

3. a.

<u>Key tools</u>: — Condition for profit-maximizing level of investment.
— Keynesian cross.

• The condition for the profit-maximizing level of investment is:
PV (stream of expected future MRPks) = Purchase price of capital.

• If firms become more optimistic, then at the old quantity of investment (for a given r), PV (stream of expected MRPks) > Purchase price.

• To restore the condition to equality, firms need to increase investment, driving MRPks down.

• So, I is higher at a given r ⇒ I demand curve shifts right.
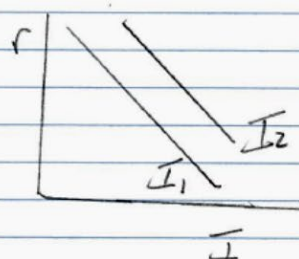
• The fact that desired (or planned) I is higher at a given r corresponds to an upward shift of the PAE line (from PAE_1 to PAE_2).
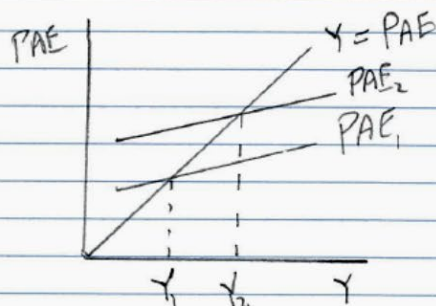
• This causes Y to rise (from Y_1 to Y_2). ($Y_1 = Y^*$)

• Rise in Y is bigger than upward shift of PAE because of the multiplier.

3.6 key tools:
- Behavior of inflation.
- Fed reaction function.
- keynesian cross

• In the short run, inflation is unchanged (because of nominal rigidity).

• The Fed sets r as a function of π following its reaction function. So π unchanged in short run $\Rightarrow r$ unchanged in short run.
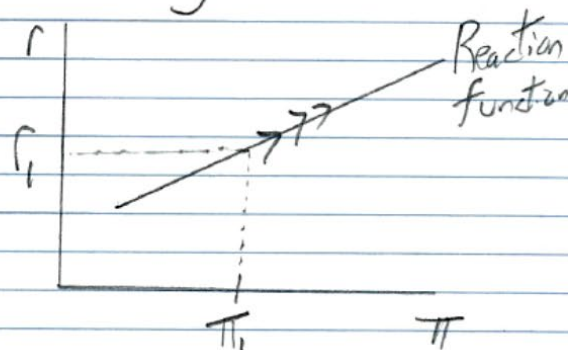
• Y is above Y^* (see path a: $Y_2 > Y_1 = Y^*$). So after a while, π starts to rise.

• The Fed, following its reaction function, raises r as π rises. (See arrows in reaction function).

• The increases in r lower C at a given Y and I^P, and so shift the PAE line down (PAE_{MR} shows one position of the PAE line during this process).
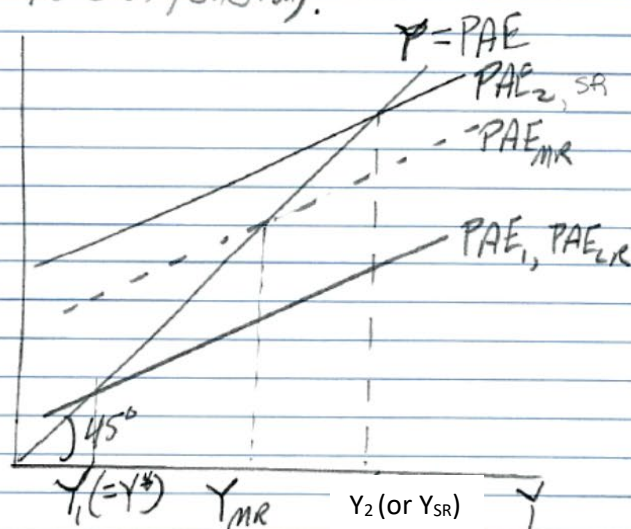
In this example, SR stands for short run, MR for medium run, and LR for long run. This is terminology we used last year, but haven't emphasized this year.

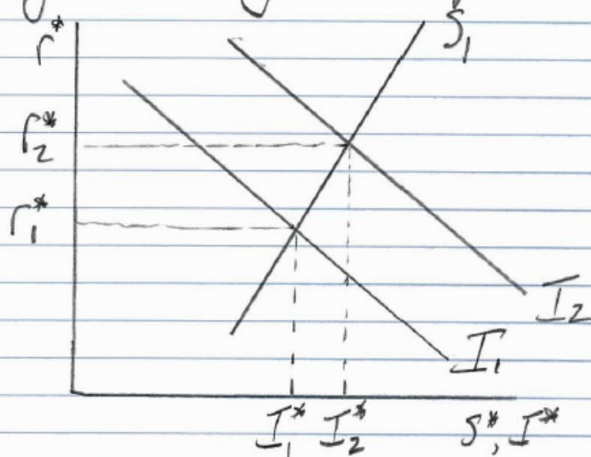• The process continues as long as $Y > Y^*$.
π' keeps rising, Fed keeps raising r, PAE line
keeps shifting down, Y keeps falling.
  • Process ends when Y is back to Y^*. (π is
steady, so r is steady so PAE stops shifting so
Y stops changing $=$ long-run equilibrium.)

3.c Key tool: Long-run saving and investment diagram

• The optimism shifts the investment demand curve to the right (see part a).
• Doesn't affect supply of saving ($Y^* - C^* - G^*$) at a given $r \Rightarrow$ saving supply curve doesn't shift.
• The diagram shows that, as a result, r^* up (from r_1^* to r_2^*) and I^* up (from I_1^* to I_2^*).

4. Key tool: 2 part diagram (market and individual firm),
including atc

Market
Individual firm
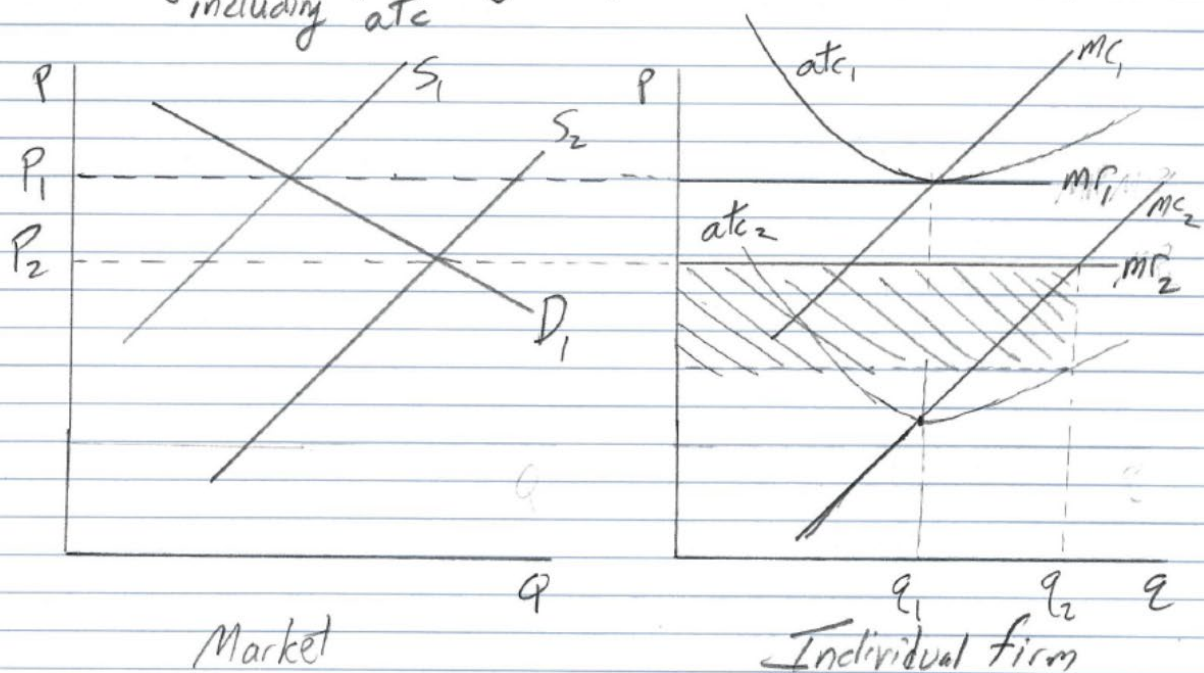
— mc of a typical firm shifts down, since input price ↓
⟹ cost of producing another unit ↓.

— It's reasonable to think that the downward shift is the
same at each q (since each unit probably uses the same
amount of cotton).

— If marginal cost of each unit falls by the same amount,
average cost up to any q also falls by that amount ⟹
atc shifts down by amount mc falls.

— The supply curve is the industry marginal cost curve, so
it too shifts down by the amount of the fall in
marginal cost.

— Because the demand curve is downward-sloping
(and not vertical), P falls by less than the fall in m.c.

(From P_1 to P_2).

— Firm produces where $mc = mr$. Initially profits are zero (the firm produces q_1, and $mr = P = mc = atc$).

— After the change, the firm produces q_2, and $P > atc \Rightarrow$ profits are positive (shaded rectangle in diagram).

5. Key tools: Supply and demand
   Effects of a tax
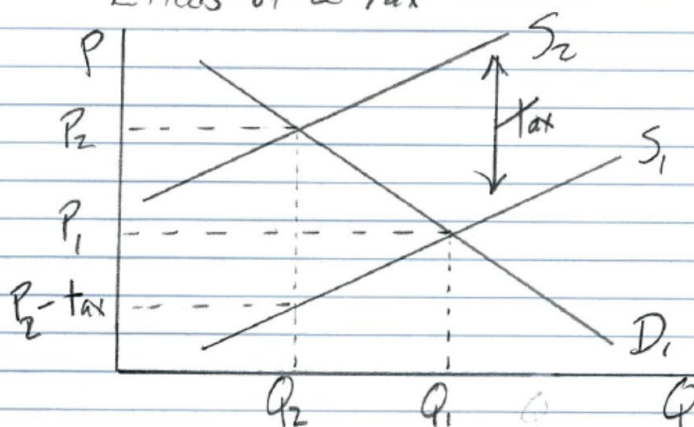
— The tax shifts the supply curve up by the amount of the tax (because producing and selling a unit now costs the producer the tax in addition to their marginal cost).

— An upward shift of the supply curve raise P: the price paid by consumers increases from P_1 to P_2.

— So, the answer to the question is "Yes!"

6. Key tool: Diagram with PPC and line showing terms of trade in world markets.

Ag.

Slope is $-\frac{P_M}{P_A}$,

A

CPC₁

B

slope $= -\frac{P_{M2}}{P_{A1}}$

PPC₁ CPC₂

Man.
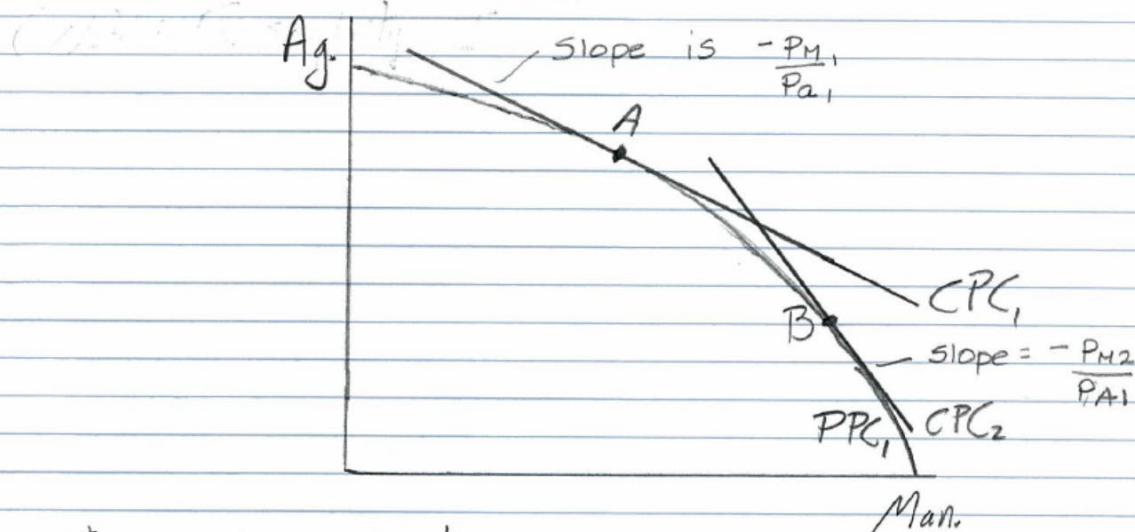
- The country wants to produce the combination of goods that has the highest value in world markets.
- That is the point on the PPC where a line reflecting the terms of trade on world markets is tangent to the PPC.
- The slope of that line (for how I've chosen which good to put on which axis) is minus P_M/P_A.
- The rise in P_M therefore makes that line steeper.
- As the diagram shows, this makes the country want to produce fewer ag. goods and more manuf. goods (moving from Point A to Point B).

7a. Key Tool: Reaction Function
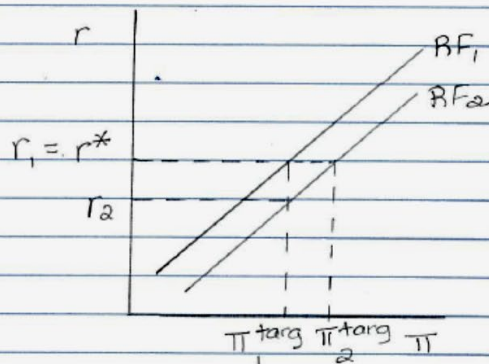
Key Points:

- Starting in l-r equilibrium means we begin at r^* and π_1^{targ}. (π^{targ} is the inflation rate that corresponds to r^* on the RF.)

- An expansionary shift in the RF means the Fed lowers r (to r_2) at the same π. Thus, Fed lowers r (π doesn't Δ in short run.)
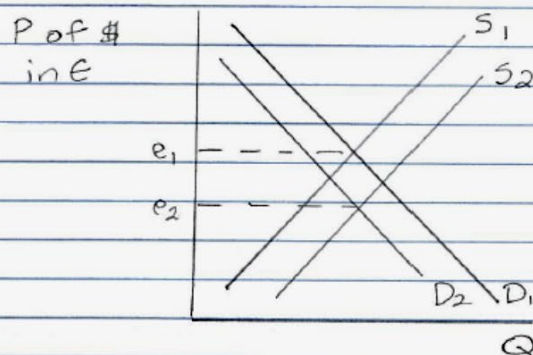- For RF_2, the π that corresponds to r^* is π_2^{targ} (which is higher).

The target rate of inflation is not something we have discussed this year. It is the rate of inflation consistent with r* on the Fed's reaction function. See the Suggested Answers to Problem Set 6 for more discussion of this topic.

7b   Key Tools: Balance of Payments
                          S & D for foreign exchang

Balance of Payments:
$$NX + KI = 0$$
or $$NX = -KI$$

P of $
in € S_1
                                        S_2

e_1 - - - - -
e_2 - - - -

                              D_2 D_1
                          Q

$ will depreciate.

Key Points :

· Expansionary change in the RF lowers r
  in the short run. KI depends positively
  on r (relative to r abroad), so KI ↓.
  BoP says if KI ↓, NX ↑.

· In market for forex, S of $ shifts out
  (because Americans want to buy foreign
  assets when their r is higher), and D
  shifts back (because foreigners want
  fewer US assets).   e falls.

· Indeed, it is the fall in e that brings
  about the rise in NX.

8a. <u>Key Tool</u>: S&D diagram with international trade

P S^{US}

$P_w + t$

P_w D^{US}

Q^{US}_{S1} Q^{US}_{S2} Q^{US}_{D2} Q^{US}_{D1} Q

Imports$_1$

Imports$_2$
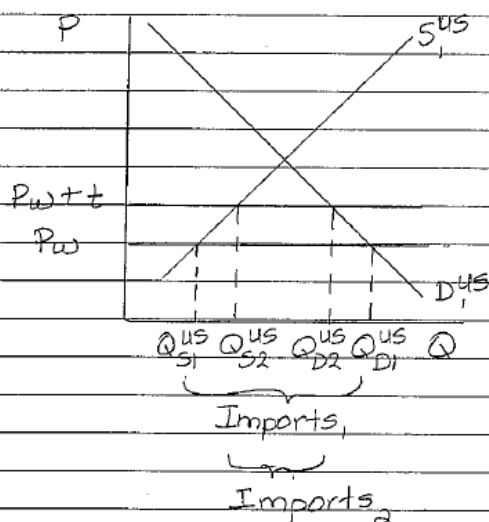
<u>Key Points</u>:

· With trade, there is an infinitely elastic world supply of avocados at the going world price.

· With a tariff (t), the price it takes to get the world to supply is $P_w + t$. That becomes the prevailing price in US as well. (That makes sense — avocados are fairly indistinguishable from one another.)

· At the higher price ($P_w + t$), American consumers buy less & American producers supply more.

· Imports fall

8.b.   Key tool: S & D with Trade
                   Slope as proxy for elasticity.
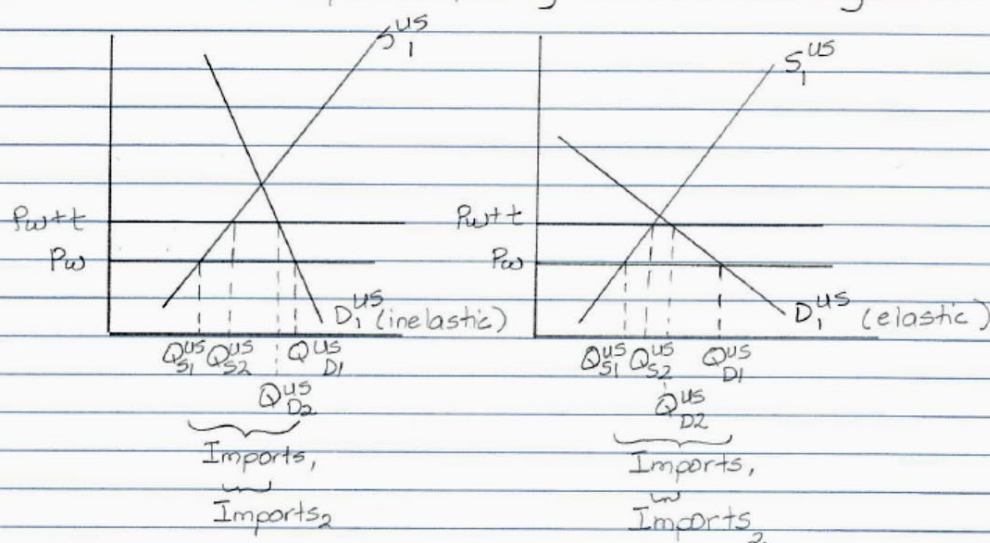
Imports fall more when demand is elastic.

Key Points:

- Elasticity can be imperfectly represented by slope of the demand (or supply) curve. A flatter demand curve is more elastic in the relevant range.

- Supply curve is the same in both cases. So, effect of ↑ in P (to $P_w + t$) ↑ US Q supplied by the same amount.

- Q_D falls more when demand is elastic. (makes sense — consumers more responsive to price).

- Imports fall more when demand is highly elastic.

8c.   __Key Tool__: Labor market diagram
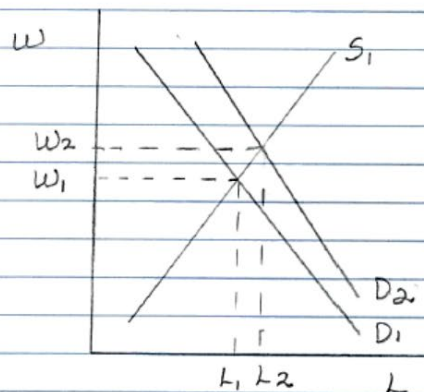
__Key Points__:

- The tariff raises the prevailing price of avocados.

- The labor demand curve is the MRP_L.
  $MRP_L = MP_L \cdot MR$
  $MR = P$ in this case (with trade there is lots of competition.

- ↑ in P, ↑ MRP_L. So, labor demand shifts out.   (Because it is multiplicative, technically the new demand curve is above & steeper than the initial one. However, students should not be penalized if they draw it parallel.)

- The shift out in labor demand, ↑ w (and L).

- This makes intuitive sense. With the tariff, the US produces more. It follows that labor demand shifts out.

9a.   Key Tools: S & D with a positive externality
welfare analysis
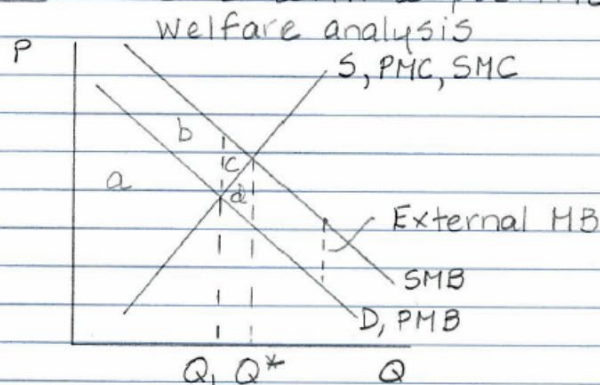
Key Points:

· SMB > PMB means this is a good with a positive externality.

· Market participants will produce where S=D, or where PMC = PMB.

· The socially optimal level of production is where SMC=SMB, which is Q*.

· We can show that the total social surplus is larger at Q* by using welfare analysis.

	at Q_1	at Q^*
Total Private Surplus	a	a − d
External Benefits	b	b + c + d
Total Social Surplus	a + b	a + b + c
DWL	c	

Social surplus is lower by c at Q_1 than at Q^*.

9b.   <u>Key Tool</u> : S & D with externality and a
                         subsidy
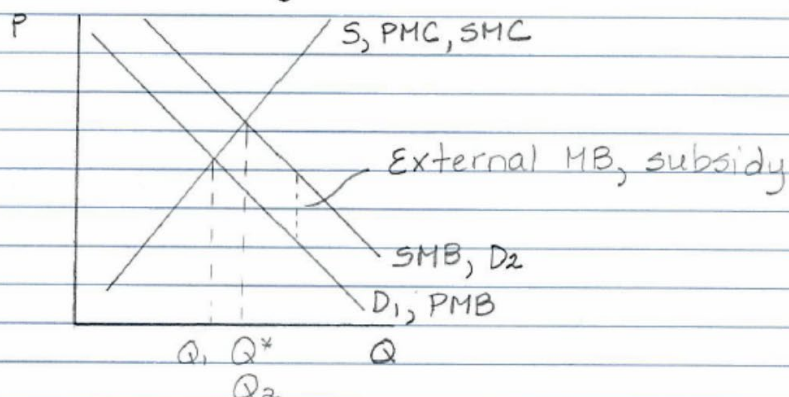
<u>Key Points</u>

- A subsidy (physically paid to consumers)
  will shift up the demand curve.

- If subsidy is set equal to External MB,
  then market will choose to produce
  Q_2 (which is equal to Q^*).

- A subsidy internalizes the positive
  externality.

PART IV: MULTIPLE CHOICE α   **[75 POINTS TOTAL]**

Circle the **best** answer to each question. Each question is worth 3 points.

10. If Thailand has a comparative advantage relative to India in producing clothing, this tells us that:
    a. the marginal product of a worker in the clothing industry in Thailand is greater than that of a worker in the clothing industry in India.
    b. the marginal **revenue** product of a worker in the clothing industry in Thailand is greater than that of a worker in the clothing industry in India.
    c. Thailand's opportunity cost of producing clothing is lower than India's.
    d. Thailand must be subsidizing its clothing industry.
    e. (a) and (b).
    f. (c) and (d).
    g. all of the above.

11. A drought in blueberry-growing areas will cause:
    a. both the price and quantity of blueberries to fall.
    b. both the price and quantity of blueberries to rise.
    c. the price of blueberries to fall and their quantity to rise.
    d. the price of blueberries to rise and their quantity to fall.

12. If the **nominal** interest rate is zero, the present value of $100 to be received a year from now is:
    a. $100.
    b. less than $100.
    c. more than $100.
    d. zero.

13. If the marginal propensity to consume is higher, the multiplier is:
    a. higher.
    b. lower.
    c. the same.
    d. it is not possible to tell.

14. Government subsidies for scientific research are likely to increase output per person in the long run by:
    a. increasing planned investment, and so shifting the PAE line in the Keynesian cross diagram up.
    b. improving the economy's technology.
    c. increasing the economy's normal employment-to-population ratio.
   d. increasing net capital inflows.

Question 15 refers to the diagram to the right, which shows the PPC in terms of military and civilian goods and services.
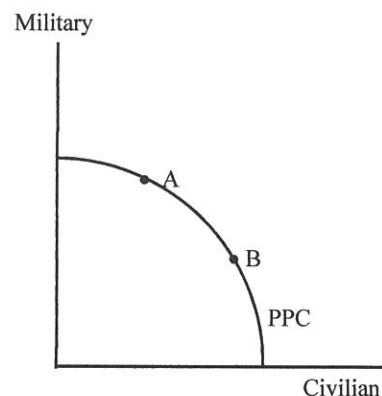
15. Comparing Points A and B, the opportunity cost of producing civilian goods and services is:
    a. greater at Point A.
    b. greater at Point B.
    c. the same at the two points.
    d. it is not possible to tell.

16. The main reason that when government purchases rise by some amount, GDP rises by more than that amount in the short run is:
    a. higher government purchases increase consumer confidence, causing consumption at a given level of disposable income to be higher.
    b. increases in government purchases are usually accompanied by tax cuts, which raise consumption at a given level of GDP.
    c. higher government purchases raise inflation, and so reduce the real interest rate, which increases consumption and investment at a given level of GDP.
    d. all of the above.
    e. none of the above.

17. Net capital inflows are:
    a. American companies' purchases of new physical capital goods minus depreciation of their existing capital.
    b. the human capital of new members of the U.S. labor force minus the human capital of individuals who exit the labor force.
    c. foreigners' purchases of American assets minus Americans' purchases of foreign assets.
    d. U.S. imports of physical capital goods minus U.S. exports of physical capital goods.

18. If negative economic profits cause some firms to exit a competitive industry:
    a. both the industry supply curve and the supply curve of a typical firm remaining in the industry shift to the left.
    b. the industry supply curve shifts to the left, and the supply curve of a typical firm remaining in the industry does not change.
    c. the industry supply curve shifts to the left, and the supply curve of a typical firm remaining in the industry shifts to the right.
    d. the industry supply curve does not change, and the supply curve of a typical firm remaining in the industry shifts to the left.
    e. neither the industry supply curve nor the supply curve of a typical firm remaining in the industry change.

19. A competitive firm will produce at the point where:
   a. marginal cost is as low as possible.
   b. the difference between marginal revenue and marginal cost is as large as possible.
   c. marginal cost is equal to the price of the good.
   d. marginal revenue is equal to the wage.

20. If the Consumer Price Index (CPI) is 200 in 2017 and 206 in 2018, inflation from 2017 to 2018 is:
   a. 3%.
   b. 6%
   c. 206%.
   d. 406%
   e. it is not possible to tell.

21. A fall in the real interest rate:
   a. causes the investment demand curve to shift to the left.
   b. causes the investment demand curve to shift to the right.
   c. causes a movement down along the investment demand curve.
   d. causes the purchase price of capital to fall.

22. Consider the budget constraint for a consumer choosing between food and clothes. If food is on the vertical axis and clothes are on the horizontal axis, the slope of the budget constraint is:
   a. the consumer's income divided by the price of clothes.
   b. the consumer's income divided by the price of food.
   c. minus the price of clothes divided by the price of food.
   d. minus the marginal utility of food divided by the marginal utility of clothes.

23. Suppose that in the market for airline pilots, there is a negotiated wage that is above the level where the quantity of labor supplied and the quantity demanded are equal. The following will reduce the normal employment of airline pilots:
   a. an increase in the negotiated wage.
   b. a fall in labor demand.
   c. a fall in labor supply.
   d. (a) and (b).
   e. (a) and (c).
   f. (b) and (c).

24. If a monopolist that is producing where marginal revenue equals marginal cost is earning negative economic profits, it will:
   a. raise its price.
   b. raise the quantity it produces.
   c. (a) and (b).
   d. exit.
   e. the situation described cannot occur.

Questions 25 and 26 refer to the diagram to the right, which shows the market for a good with a negative externality that is bought and sold in a competitive market.
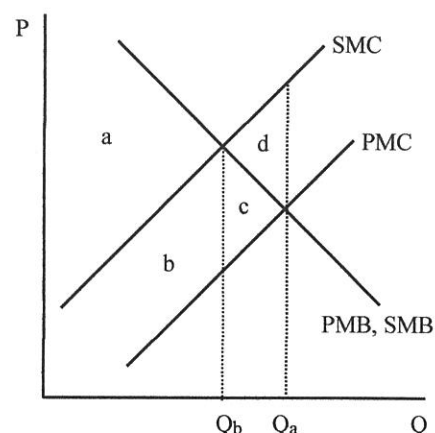
25. If there is no government intervention, the deadweight loss will be:
   a. area c.
   b. area d.
   c. at least area c, but almost certainly more.
   d. at least area d, but almost certainly more.
   e. zero.

26. If the government imposes a per unit tax, physically collected from the seller, so that the quantity produced is the amount the makes total social surplus as large as possible, government revenue will be:
   a. area b.
   b. area b + c.
   c. area b + c + d.
   d. area b + c − d.

27. A utility-maximizing household will allocate its spending so that:
   a. the total utility it gets from each good is the same.
   b. the additional utility it gets from one more unit of each good is the same.
   c. the additional utility it gets from spending one more dollar on each good is the same.
   d. the average utility it gets per dollar spent is the same for each good.

28. The following development will cause both employment and the wage in a labor market to fall:
   a. a rightward shift of the labor demand curve.
   b. a leftward shift of the labor demand curve.
   c. a rightward shift of the labor supply curve.
   d. a leftward shift of the labor supply curve.

29. If a country with a comparative advantage in producing goods that mainly use low-skilled labor becomes open to international trade and so begins to export those goods, we would expect:
   a. income inequality in the country to fall.
   b. income inequality in the country to rise.
   c. the wages of both high-skilled and low-skilled workers in the country to rise, with an ambiguous effect on income inequality.
   d. the wages of both high-skilled and low-skilled workers in the country to fall, with an ambiguous effect on income inequality.

30. The following is the most important cause of the large increases in total output per person in the U.S. over the past century:
    a. improvements in technology.
    b. increases in normal physical and human capital per worker.
    c. increases in the normal employment-to-population ratio.
    d. increases in aggregate demand.

31. Suppose the price elasticity of supply in a competitive market is very high. Then an outward shift of the demand curve will tend to cause:
    a. a large rise in quantity and a small rise in price.
    b. a small rise in quantity and a large rise in price.
    c. a large fall in quantity and a small rise in price.
    d. a small fall in quantity and a large rise in price.

32. As one moves up along the expenditure line (PAE):
    a. consumption is increasing.
    b. planned investment is increasing.
    c. government purchases are increasing.
    d. net exports are increasing.
    e. none of the above.
    f. all of the above.

33. Suppose that in a competitive market, the price is P_1 and the quantity is Q_1. If the government introduces a per unit tax of amount t on the good, its revenue is likely to be:
    a. t times Q_1.
    b. less than t times Q_1.
    c. more than t times Q_1.
    d. less than t times Q_1 if demand is elastic, and more than t times Q_1 if demand is inelastic.
    e. less than t times Q_1 if demand is inelastic, and more than t times Q_1 if demand is elastic.

34. A fall in the normal real interest rate in foreign countries will cause:
    a. both the normal real interest rate and normal investment in the U.S. to fall.
    b. both the normal real interest rate and normal investment in the U.S. to rise.
    c. the normal real interest rate in the U.S. to fall, and normal investment in the U.S. to rise.
    d. the normal real interest rate in the U.S. to rise, and normal investment in the U.S. to fall.