Answers:

1. B
2. A
3. D
4. D
5. E
6. B
7. E
8. A
9. D
10. D
11. B
12. D
13. C
14. D
15. A
16. B
17. A
18. E
19. C
20. C
21. D
22. D
23. D
24. B
25. B
26. C
27. C
28. A
29. A
30. D

Solutions

1. Consider the two options Erika has: Keep the Shop Open, or Close the Shop and work at Doughnut Emporium. With the given information, we can calculate the Economic Profit Erika earns from each of her two possible choices.

   We know that:
   Economic Profit = Accounting Profit - Opportunity Cost
   Accounting Profit = Accounting Revenue - Accounting Cost.

   If Erika keeps the shop open:
   Accounting Profit = \$49000 - (\$37000 + \$15000) = \$-3000
   Economic Profit = \$-3000 - (\$10000 - \$15000) = \$-3000 - \$-5000 = \$2000.
   Since the Economic Profit is positive for Keeping the Shop open, this is Erika's Profit-Maximizing Choice. B.
2. Income goes up \$40,000 and consumption \$30,000. The MPC =3/4= 0.75 A
3. The Price is \$276. Therefore, the only people who will buy a new phone are those whose willingness to pay is greater than \$276. Thus, only Lillian and Ellen will buy a new phone.
   Lillian's Consumer Surplus: $CS_L = \$420 - \$276 = \$144.$
   Ellen's Consumer Surplus: $CS_E = \$357 - \$276 = \$81.$
   Total Consumer Surplus: $CS = \$81 + \$144 = \$225.$ D.
4. Generically, $PED = -(\frac{\Delta QD}{QD} / \frac{\Delta P}{P})$ (in the Directions, it states that we use the positive value for the PED, so this is the correct formula), and $PES = \frac{\Delta QS}{QS} / \frac{\Delta P}{P}$. For a single point, we thus have $PED = \lim_{\Delta P \to 0}[-(\frac{\Delta QD}{QD} / \frac{\Delta P}{P})]$, and $PES = \lim_{\Delta P \to 0}(\frac{\Delta QS}{QS} / \frac{\Delta P}{P})$.

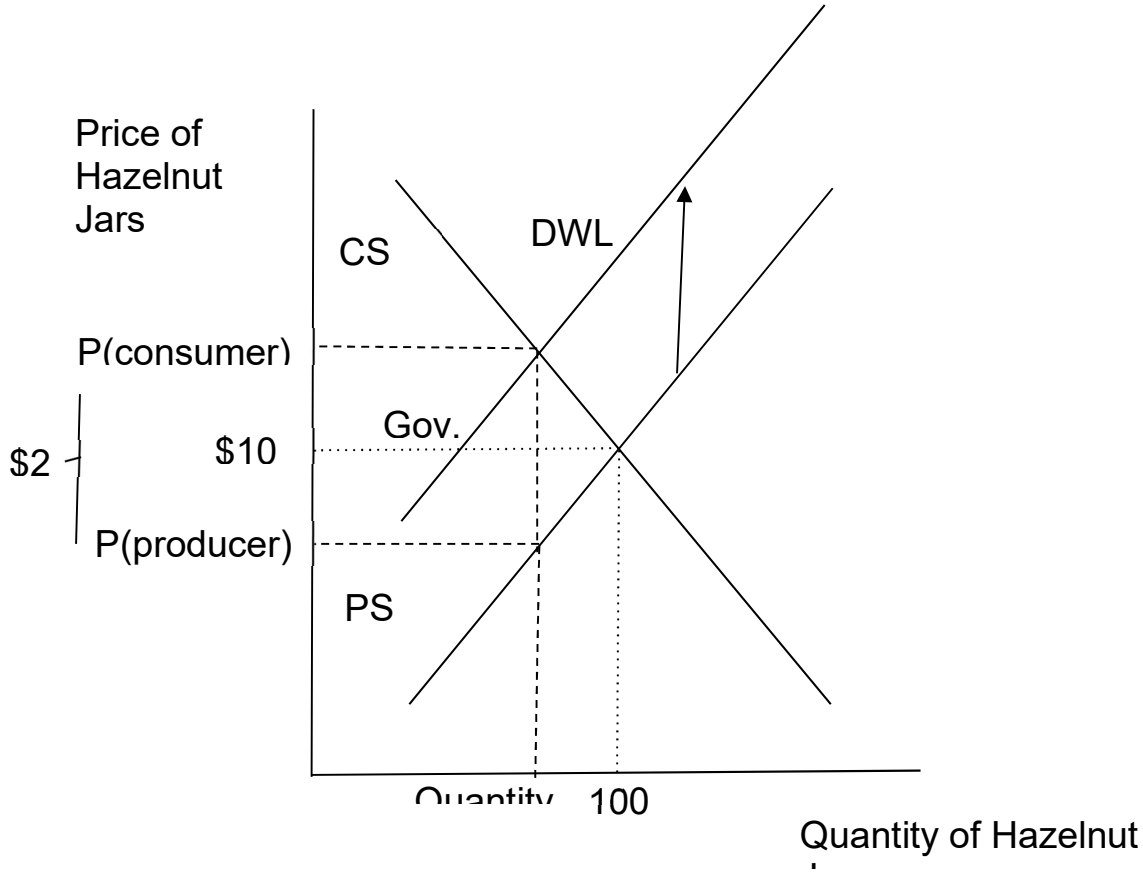
   The current Equilibrium is the point of intersection of the graphs QS = 200 - 10P and QD = 10P. Thus, $200 - 10P = 10P \Rightarrow 20P = 200 \Rightarrow P = 10. QD = QS = 10P = 100.$

   Additionally, $\lim_{\Delta P \to x} \Delta QD = [200 - 10(P + x)] - (200 - 10P) = -10x$, and
   $\lim_{\Delta P \to x} \Delta QS = 10(P + x) - 10P = 10x$

$$PED = \lim_{\Delta P \to 0}[-(\frac{\Delta QD}{QD} / \frac{\Delta P}{P})] = \lim_{\Delta P \to 0}[-(\frac{-10\Delta P}{100} / \frac{\Delta P}{10}) = \lim_{\Delta P \to 0}[-(\frac{-10\Delta P}{100} \cdot \frac{10}{\Delta P})]$$
$$= -\frac{-10 \cdot 10}{100} = 1$$

$PES = \lim_{\Delta P \to 0}(\frac{\Delta QS}{QS} / \frac{\Delta P}{P}) = \lim_{\Delta P \to 0}(\frac{10\Delta P}{100} / \frac{\Delta P}{10}) = \lim_{\Delta P \to 0}(\frac{10\Delta P}{100} \cdot \frac{10}{\Delta P}) = \frac{10 \cdot 10}{100} = 1$ D.

5. As a \$2 Per-Unit Tax, the Tax will create a Tax Wedge with height of \$2 in the market for Hazelnut Spread Jars, as per the following Graph:



The difference between the price the consumer pays and the revenue the producer receives is \$2. The Quantity Produced and Consumed is the same. Thus, $Q = 200 - 10P_{Consumer} = 10 \cdot (P_{Consumed} - 2) = 10P_{Consumed} - 20 \Rightarrow 220 = 20P_{Consumed} \Rightarrow P_{Consumed} = \$11$
$\Rightarrow Q = 200 - 10 \cdot 11 = 200 - 110 = 90$. 90 is the Quantity Consumed with Tax. E.

6. The DWL is the area of the Tax wedge generated by the Tax. As shown in the Solution to Question 4, the vertical side of this triangle has length 2, and the Quantity Consumed/Produced is 90. Thus, the Horizontal height of the triangle is $100 - 90 = 10$.
   $DWL = \frac{2 \cdot 10}{2} = \$10.$ B.
7. At \$6, $QD = 200 - 10P = 200 - 10 \cdot 6 = 200 - 60 = 140.$
   $QS = 10 \cdot 6 = 60.$
   More Hazelnut Spread Jars are Demanded than supplied, so there is a Shortage of $(140 - 60 =) 80.$ E.
8. Each of the customers will continue to consume Waffles until their marginal willingness to pay is lower than the price of the next Waffle. Thus, Henrik will consume 3 waffles, Jonathan will consume 1, and Muzi will consume 2.

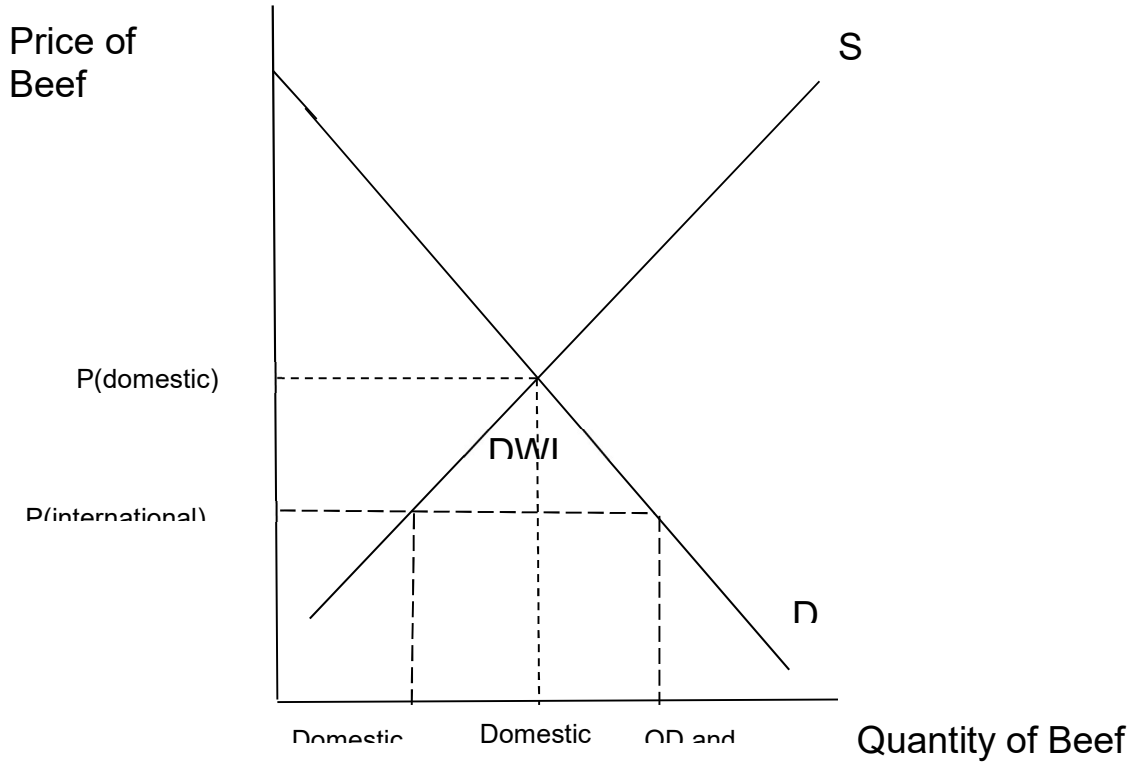
   Consumer Surplus for each customer:
   Henrik: $CS = \$((6.30 - 4.70) + (5.70 - 4.70) + (4.90 - 4.70)) = \$(1.60 + 1.00 + 0.20) = \$2.80.$

Jonathan: $CS = \$(5.20 - 4.70) = \$0.50.$
Muzi: $CS = \$((5.90 - 4.70) + (5.50 - 4.70)) = \$(1.20 + 0.80) = \$2.00.$

Thus, overall, $CS = \$2.80 + \$2.00 + \$0.50 = \$5.30$. A.

9. Using the Willingness to Pay as a measure of Marginal Utility for each Waffle, Diminishing Marginal Utility will be demonstrated by individuals who have a lower willingness to pay for each successive Waffle.
   Henrik: \$6.30 > \$5.70 > \$4.90
   Jonathan: \$5.20 > \$4.40 > \$4.10
   Muzi: \$5.90 > \$5.50 > \$4.60
   Thus, Henrik, Jonathan, and Muzi all demonstrate diminishing Marginal Utility. D.
10. First, calculate Real GDP in 2019, using 2009 as the base year. Since prices rose 20%, Prices are currently at 120% of what they were in 2009. Thus, Real GDP in 2019 is $\$42000 \cdot \frac{100}{120} = \$35000.$

    We know that Real GDP Per Capita in 2019 is 4 times what it was in 2009, and there is 160 more population. If we define *x* as the 2019 population, Real GDP Per Capita in 2019 is $\frac{\$35000}{x}$, and Real GDP Per Capita in 2009 was $\frac{\$7000}{x-160}$. Solve the equation: $4 \cdot \frac{\$7000}{x-160} = \frac{\$35000}{x} \Rightarrow \frac{4}{x-160} = \frac{5}{x} \Rightarrow 4x = 5x - 800 \Rightarrow x = 800.$ D
11. The country has been experiencing 100% daily inflation. Thus, prices double every day. Thus, in the last week, the price of Sanika's Gold has been multiplied by $2^7 = 128$. Define *G* as the value of Gold (in 1 week-old dollars) that Sanika buried, and *C* as the number of dollars that she put in her wallet.
    We can solve the following system of equations:
    $G + C = \$720$, and $128G + C = 13420.$
    Subtracting the first equation from the second, we have $127G = 13420 - 720 = 12700.$
    Dividing by 127, we have $G = 100, C = 720 - 100 = 620.$ B.
12. Observe the following graph of the US Market for Beef:



Without Trade, Net Benefits to Society (= Producer Surplus + Consumer Surplus) will simply be the Area under the Demand Curve and Above the Supply Curve.

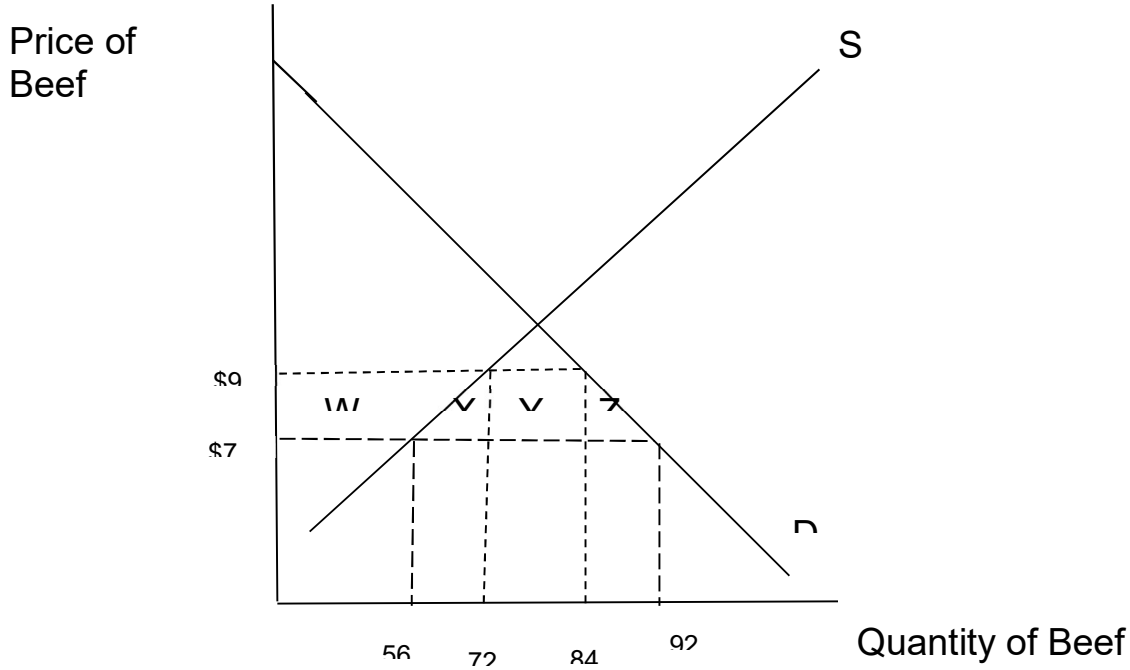
With Trade, Producer Surplus is now the Area under P(international) and above the Supply Curve, while Consumer Surplus is now the area above P(international) and under the Demand Curve. Thus, international trade adds the triangle labeled "DWL" into Domestic Net Benefits. Therefore, the area of this triangle is is the Deadweight Loss Associated with not Trading.

P(domestic) is the intersection of QD and QS. $120 - 4P = 8P \rightarrow 12P = 120 \rightarrow P = \$10$.
P(international) = P(domestic) - \$3 = \$10 - \$3 = \$7.
Domestic QS with Trade = $8 \cdot 7 = 56$.
QD with Trade = $120 - 7 \cdot 4 = 92$.

Height of Triangle: \$3. Width: 92 - 56 = 36. Area = $\frac{36 \cdot \$3}{2} = \$54$. Since the Quantity of Beef is in billions of pounds, DWL is \$54 billion. D.

13. This Tariff will raise the price that Domestic Consumers pay for Beef by \$2, from \$7 to \$9, implying that the new Domestic QD is $QD = 120 - 4 \cdot 9 = 84$. At a price of \$9, Domestic Beef Producers will Supply $QS = 8 \cdot 9 = 72$. The remaining 12 billion pounds of Beef are sold by International Beef Producers. Thus, Govt. Revenue from the Tariff is $12\ billion \cdot \$2 = \$24\ billion$.C.

14. The following graph can be used to represent the US Beef Market with and without a $2 Tariff.:



With no Tariff, CS is the area above the World Price ($7) and below the Demand Curve, and PS is the area above the Supply curve and below $7. With the tariff, US consumers pay $9 per pound of Beef, and thus their new CS is the area above $9 and below the Demand Curve, while PS is the area below the new price ($9) and above the Supply Curve.

Thus, $CS_{Tariff} = CS_{No\ tariff} - W - X - Y - Z$, and $PS_{Tariff} = PS_{No\ Tariff} + W$.
We are looking for how much CS and PS change with Free Change, relative to with the Tariff. We have determined that CS increases by (W+X+Y+Z), and PS decreases by W.

Area Calculations
$Area(W) = \frac{56+7}{2} \cdot \$2 = \$128.$ $Area(W+X+Y+Z) = \frac{92+84}{2} \cdot \$2 = \$176.$
Thus PS decreases by $128 billion, and CS increases by $176 billion. D.

15. Because of Political Instability, Indian financial assets will look less attractive. Thus, the Rupee will depreciate as fewer people buy rupees to buy Indian assets. The depreciation of the Rupee will make Indian goods cheaper to Americans, who will buy more Indian goods. This means India exports more to the United States. A.

16. Bengladesh must produce 6 bushels of rye per worker for its 150 workers. Thus it must produce $6 \cdot 150 = 900$ bushels of rye. Each worker can produce 8 bushels of rye, so $\frac{900}{8} = 112.5$ workers must be employed to make Rye. However, a worker can not produce Rye and Iron in a year, so 113 workers must produce Rye, and the remaining 150 - 113 = 37 must produce Iron. the amount of Iron produced is thus $37 \cdot 10 =$

370pounds.

Similarly, Arjuntina must produce $6 \cdot 40 = 240$ bushels of Rye, which takes $\frac{240}{30} = 8$ workers. The remaining 32 workers can produce $32 \cdot 20 = 640$ pounds of Iron. 640 + 370 = 1010 pounds of Iron, together. B.

17. In order to see who should produce Rye, we must see who has the lower opportunity cost for Rye Production.
Opportunity Cost calculation:
Arjuntina: $\frac{20\ lb.Iron}{30\ bushel\ Rye} = \frac{2}{3}$lb. Iron per bushel of Rye
Bengladesh: $\frac{10\ lb.Iron}{8\ bushel\ Rye} = \frac{5}{4}$lb. Iron per bushel of Rye
Thus, Arjuntina should specialize in Rye production.

Since the world needs $(150 + 40) \cdot 6 = 190 \cdot 6 = 1140$bushels of Rye, Arjuntina will devote $\frac{1140}{30} = 38$ workers to Rye production, and the remaining 2 to Iron Production. Arjuntina will thus produce $2 \cdot 20 = 40$pounds of Iron, while Bengladesh produces $150 \cdot 10 = 1500$ pounds of Iron. Thus, the world produces $1500 + 40 = 1540$ pounds of Iron.
A
18. Arjuntina would only produce Rye, while Bengladesh would only produce Iron. The two workers who produced Iron in Arjuntina would instead produce Rye. Thus, instead of producing 40 lb Iron, they produce 2*30=60 bushels of Rye.
Iron decreases by 40 pounds, Rye increases by 60 bushels. E.
19. The question asks for the maximum value of GDP for Arjuntina and Bengladesh, together. We can obtain this situation by simply calculating the maximum GDP for each country, and summing those GDP's.
For each country, $GDP = \$20\ per\ bushel\ Rye \cdot X\ bushels\ Rye + \$20\ per\ pound\ Iron \cdot Y\ pounds\ Iron$.

Let us examine the GDP-maximizing choice for each country:

Arjuntina: Each worker can produce 30 bushels of Rye or 20 pounds of Iron. This is equivalent to saying a worker can produce $30 \cdot \$20 = \$600$ worth of Rye or $20 \cdot \$20 = \$400$ worth of Iron. Therefore, the GDP maximizing choice for Arjuntina is to Produce only Rye. Arjuntina's GDP is thus $40\ workers \cdot 30\ bushels/worker \cdot \$20\ per\ bushel = \$24000$.

Similarly, Bengladesh workers can each produce $10\ pounds\ Iron \cdot \$20\ per\ pound\ Iron = \$200$ worth of Iron, or $8\ bushels\ Rye \cdot \$20\ per\ bushel = \$640$ worth of Rye. Bengladesh will only produce Iron, giving a GDP of $10\ pound\ Iron/worker \cdot \$20\ per\ pound\ Iron \cdot 150\ workers = \$30000$.

Thus, Maximum combined GDP is \$24000 + \$30000 = \$54000 C.

20. Generally, the marginal cost of producing the n-th thousand cars is $TC(n) - TC(n-1) = (2n^2 - n + 70) - (2 \cdot (n-1)^2 - (n-1) - 70) = 2(n^2 - (n-1)^2) - (n - (n-1)) + (70 - 70)$
$= 2(n - (n-1))(n + (n-1)) - (1) + 0 = 2(1)(2n-1) - 1 = 4n - 2 - 1 = 4n - 3.$

    We want the Marginal Cost of the 1001th thousand cars, which is $4 \cdot 1001 - 3 = 4004 - 3 = 4001$. Since this is measured in thousands of dollars, the answer is \$4001000. C.
21. The multiplier is 10. 10 times 20 is 200. They bring in \$20 billion but they could lose 200 billion for a potential loss of \$180 billion D
22. Decrease in consumer spending - decreased Aggregate Demand - higher unemployment and lower prices - not A.
    Lowering Interest Rates - Cheaper to borrow, which means higher investment (increase in AD), which means lower unemployment - not B.
    Expectation of Higher Prices - Companies will produce more now to sell in the future, which will mean lower unemployment now - not C.
    Tariff on raw materials - Higher input costs, Aggregate Supply decreases, higher unemployment and higher prices - D.
23. The Buying of Bonds on the open market causes an increase in Money Supply. In the Money Market, this will be a rightward shift in the Money Supply, leading to a lower interest rate. This lower interest rate makes US Financial Assets less attractive, and thus demand for the Dollar decreases, leading to Depreciation of the Dollar. This causes US Goods and Services to be relatively less expensive, causing Exports to increase and Imports to decrease. D.
24. In a recession, Unemployment is High, which makes labor less expensive. Labor is an input factor, and the reduced input costs cause SRAS to increase. This shift in the SRAS cause Output to increase and the Price Level to decrease. LRAS does not change, as it is defined as the Full-Employment level of Output, and nothing has affected what happens at Full-Employment. B.
25. Consider that each Bank in Canada must have an equal amount of money in Demand Deposits as they have in Loans+Reserves. Therefore, across all Canadian Banks, $\$720 + \$240 + Loans = \$4800$. Therefore, $Loans = \$4800 - \$960 = \$3840$.
    B.
26. The proportion of deposits that Banks hold as reserves is $\frac{\$960}{\$4800} = \frac{1}{5}$. Thus, the Money Multiplier is 5. If they want to decrease Money Supply by \$2400, they have to Sell \$X worth of bonds such that $5X = 2400$. Therefore, $X = \frac{2400}{5} = 480$. The Central Bank must Sell \$480 of Bonds. C.
27. Currently, Banks have deposits of \$4800, and since their Required Reserves are \$720, the Required Reserve Ratio is $\frac{\$720}{\$4800} = \frac{3}{20}$. The Money Multiplier is therefore $\frac{20}{3}$, and thus when the \$240 of non-required reserves are loaned out, the amount of new Deposits is

$\$240 \cdot \frac{20}{3} = \$1600$. However, the $240 that was lent out was in the money supply to begin with, Money Supply increases by $\$1600 - \$240 = \$1360$. C.

28. The Quantity Theory of Money States that MV=PQ, where M is money supply, V is Money Velocity, P is Price Level, and Q is overall Production (GDP).
Let V be the constant velocity over the 2 time periods. Also, let P1 = 1, Q1 = 1, and M1 = 1, since only the change in these quantities matters. Use the following two equations to solve for P2:
V = P1 * Q1 / M1 = 1 * 1 / 1 = 1
V = P2 * Q2 / M2 = P2 * (1 + .25) / (1+.5) = p2 * (1.25 / 1.5) = (⅚) P2 = 1
Therefore, P2 = (6/5) * 1 = 1.2. Thus, inflation over the year is (P2-P1)/P1 = (1.2 - 1) / 1 = .2 = 20%.
A

29. The government must borrow Money in the form of Loanable Funds. In the Market for All Loanable Funds, this can be viewed either as a Decrease in Supply or Increase in Demand for Loanable funds. Either way, the Real Interest Rate Rises.
In the Market for Private Loanable Funds, the Decrease in Supply of Loanable Funds causes the Quantity of Private Loanable Funds to decrease. A.
30. Using the Midpoint method, the Cross-Price Elasticity of Demand for Molts with respect to Bluchs is given by the following formula: $CPE = (\frac{\Delta Q \ \ Molts}{QD_{Molts}} / \frac{\Delta P_{Bluch}}{P_{Bluch}})$. Thus, $CPE = (\frac{40-20}{30} / \frac{\$50 \ \ \$30}{\$40}) = (\frac{20}{30} \cdot \frac{40}{20}) = \frac{4}{3}$. Additionally, because an increase in the price of Bluchs caused an increase in Demand for Molts, they are Substitutes. D