Question 1

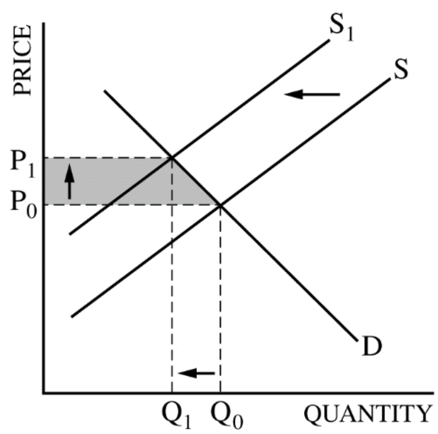
10 points (3+3+4)

(a) 3 points:

- One point is earned for stating that the quantity supplied exceeds the quantity demanded at the price floor **or** the price floor would result in a surplus because the price floor is binding or effective.
- One point is earned for correctly calculating the price elasticity of supply.
  Students can use either the midpoint formula or the point elasticity formula.
  $E = (500/1250) / (0.2/1.1) = 2.2$
  $E = (50\%/20\%) = 2.5$
  $E = (500/0.2) \times (1/1000) = 2.5$
  $E = [(1500–1000)/1000]/[(1.2–1)/1] = 0.5/0.2 = 2.5$
  $E = (500/0.2) \text{ x } (1.2/1500) = 2$

- One point is earned for stating that the supply is elastic and for explaining that the **percentage** change in quantity supplied exceeds the **percentage** change in price or because price elasticity of supply is greater than one. (Other equivalent explanations are accepted.)

(b) 3 points:

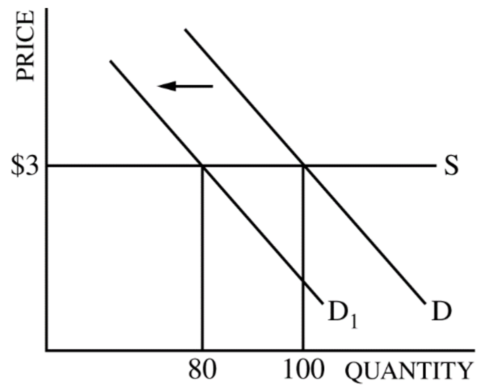


- One point is earned for drawing a correctly labeled graph and for showing the equilibrium price and quantity, labeled P_0 and Q_0, respectively.
- One point is earned for shifting the supply curve to the left and for showing the new equilibrium price and quantity, labeled P_1 and Q_1, respectively.
- One point is earned for completely shading on the graph the area representing the change in consumer surplus.

Question 1 (continued)

(c) 4 points:

- One point is earned for stating that coffee and muffins are complementary goods.



- One point is earned for drawing a correctly labeled graph for the coffee market and showing a horizontal supply curve (S) and a downward sloping demand curve (D).
- One point is earned for shifting the demand curve to the left and for showing a decrease in the equilibrium quantity and no change in the equilibrium price of coffee.
- One point is earned for correctly calculating the new equilibrium quantity and showing the work.

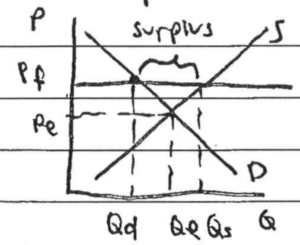
  $\%\Delta Q = (10\% \times -2) = -20\%$
  New Equilibrium Quantity = $100 \times (-20\%) = 80$
  OR
  New Equilibrium Quantity = $100 - (0.2 \times 100) = 80$

(Using the midpoint formula is also acceptable.)

1A

ADDITIONAL PAGE FOR ANSWERING QUESTION 1

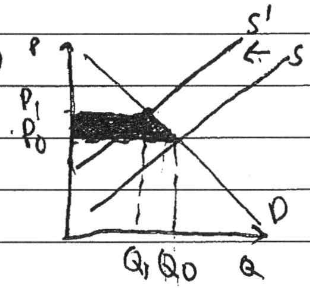
1a) i) surplus! $Qs > Qd$



ii) $\frac{\%\Delta Q}{\%\Delta P} = \frac{\frac{500}{1000}}{\frac{.2}{1}} = \frac{50\%}{20\%} = \frac{5}{2}$

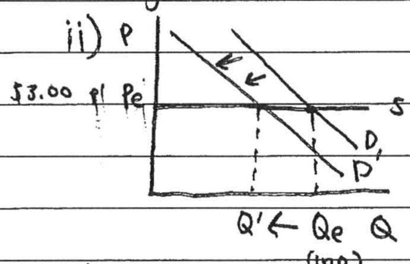
iii) elastic since $\frac{5}{2} > 1$

b)



c) i) complimentary goods since cross price elasticity is negative, so when $P_x \uparrow$ $Q_y \downarrow$.

ii)



P no Δ

Q ↓

iii) $\frac{\%Qe}{\%P_m} = -2$

$\frac{\%Q}{10} = -2$

$\%Q = -20\%$, so -20% of 100 is 80, so $\boxed{80}$

GO ON TO THE NEXT PAGE.

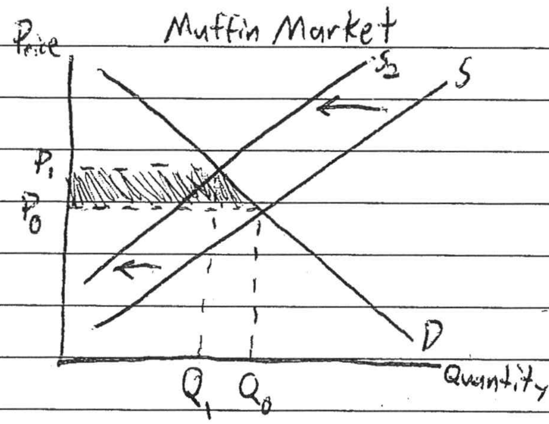
1ai) The price floor would result in a surplus. By raising the price of bananas above the equilibrium price, the quantity supplied would be greater than the quantity demanded

1aii) Price elasticity of Supply $= \frac{[(P_2 - P_1)/(P_2+P_1)]}{[(Q_2-Q_1)/(Q_2+Q_1)]} = \frac{[(1.20-1)/(1.20+1)]}{[(1500-1000)/(1500+1000)]}$

$\frac{.20/2.20}{500/2500} = \frac{1/11}{1/5} = \boxed{\frac{5}{11}}$

1aiii) The supply is ~~el~~ elastic between \$1 & \$1.20. The midpoint elasticity is 5/11 which is between 0 & 1 meaning the quantity is changing ~~faster~~ at a greater rate than price resulting in elastic supply

b)



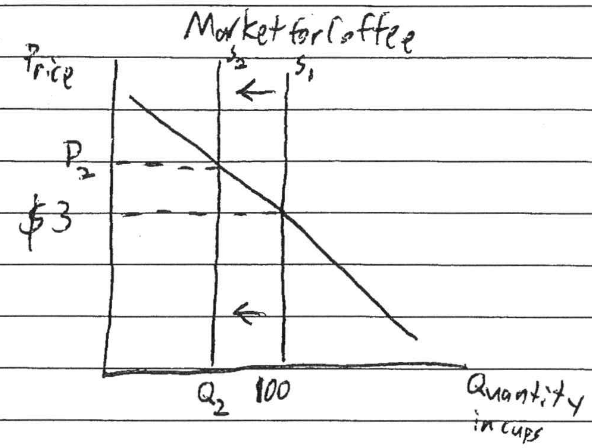
ci) Coffee and muffins are complementary Goods

~~cii)~~ cii) & ciii) see next page

1B 2 of 2

ADDITIONAL PAGE FOR ANSWERING QUESTION 1

c ii)



$P_2 > \$3$

$Q_2 < 100$

c iii) $\frac{\Delta Q_B}{.1} = -2$ $\qquad \Delta Q_B = -.2$

$\frac{\Delta Q_B}{\Delta P_A}$ = cross price elasticity

~~Where ΔQ_B is the quantity of cups of coffee~~

where

ΔQ_B is the change in % of cups of coffee &

ΔP_A is the change in % of the price of muffins

$100 \cdot -.2 = -20$

$100 - 20 = 80$

$\boxed{Q_2 = 80 \text{ muffins}}$

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1 C

ANSWER PAGE FOR QUESTION 1

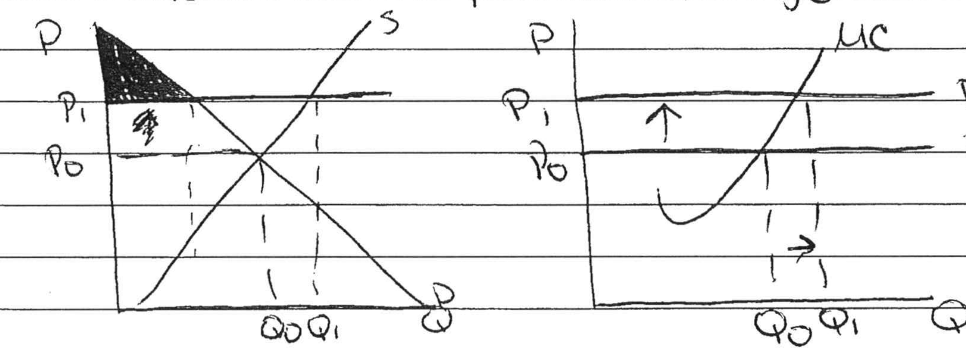
a. i - The price floor would result in a surplus because quantity supplied is greater than quantity demanded. Therefore, there are more bananas than there's a demand for them.

ii - The price elasticity of supply is $.20

$1.20 - $1.00 = $.20

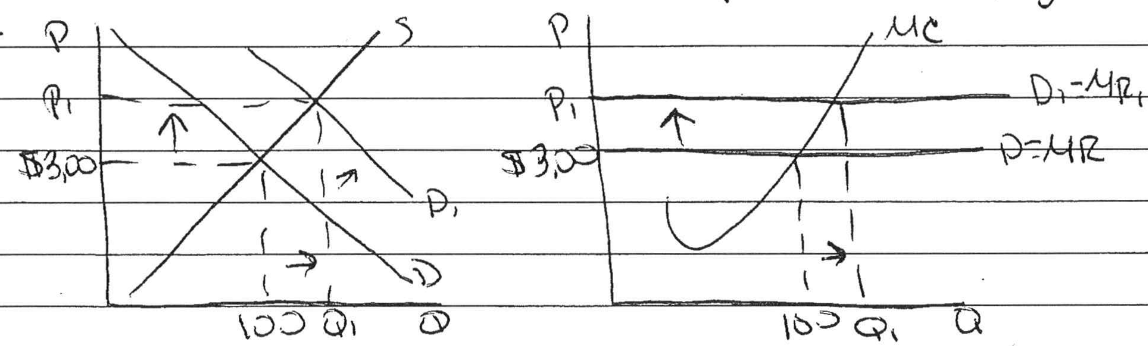
iii - The supply is elastic because it is unaffected by the change in price.

b. i



C. i - Coffee and muffins are complementary goods

ii -



iii - $(.1)(3) = \$30.00$

$$\frac{\$3}{100} = \frac{\$30}{x}$$

$$\frac{3x}{3} = \frac{3000}{3} \quad x = 1000$$

The new equilibrium quantity in the coffee market is 1,000 cups.

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Question 1

Overview

This question assessed the students' ability to interpret and apply the supply and demand model to analyze the impact of changes in several economic variables on market equilibrium. Part (a) assessed the students' ability to determine the effect of a price floor in a market; to calculate the price elasticity of supply; and to explain if supply is elastic, inelastic, or unit elastic. Part (b) tested the students' ability to display graphically the market for a good, determining the equilibrium price and quantity, showing the effect on the market price and quantity when the price of an input rises, as well as the change in consumer surplus as a result of the higher input cost. In part (c) students were given information regarding the equilibrium price and quantity of coffee and a negative cross-price elasticity coefficient between coffee and muffins. Students were asked whether the goods are normal, inferior, complementary, or substitute goods. Students were also asked to draw a diagram illustrating the market for coffee when market supply is perfectly elastic, the equilibrium price and quantity of coffee, and the effect of an increase in the price of the complementary good to coffee. Lastly students were asked to show the calculation for the new equilibrium quantity of coffee, given the cross-price elasticity of demand.

Sample: 1A
Score: 10

The student answers all parts of the question correctly and earned all the points.

Sample: 1B
Score: 6

The student did not earn 1 point in part (a)(ii) for incorrectly writing the formula for price elasticity of supply. The student did not earn 1 point in part (a)(iii) for incorrectly stating that supply is elastic because the elasticity coefficient is between 0 and 1. The student did not earn the first point in part (c)(ii) for drawing a perfectly inelastic supply curve. The student did not earn the second point in part (c)(ii) for incorrectly shifting the supply curve.

Sample: 1C
Score: 3

The student earned 1 point in part (a)(i) for stating the surplus results when the quantity supplied is greater than the quantity demanded. The student earned 1 point in part (b)(i) for drawing a correctly labeled graph that shows the equilibrium price and quantity labeled P_0 and Q_0. The student earned 1 point in part (c)(i) for correctly stating coffee and muffins are complementary goods.