

Appendix: Matched Questions from Baruch College Exams

Common Exams Before and During COVID-19 Pandemic

Introduction

The common exams had two versions. These questions are all from exam version A. We found the same matches for version B. Including questions from both versions, we found in total **35 pairs of questions** that are similar in common exams before and during the pandemic period.

Match 1 (Fall 2019: Fall 2020) *Hard*

F19

Table 6.

		Nintendo	
Sony	Reduce Price	Reduce Price \$20 million \$20 million	Don't reduce price \$10 million \$40 million
	Don't reduce price	\$10 million \$40 million	\$30 million \$30 million

Refer to Table 6: What is the Nash Equilibrium?

- a) Both firms reduce their price.
- b) No firm reduces their price.
- c) Nintendo reduces prices and Sony does not.
- d) Sony does not reduce prices and Nintendo does.

F20

Microsoft Azure and Amazon AWS control most of the cloud computing market. Suppose the diagram below represents their strategic options. If both firms charge 5 cents/GB for storage space monthly they will each earn ten billion dollars. If AWS charges 2 cents, while Azure charges 5 cents, AWS will earn \$12.5 billion and Azure will earn \$5 billion, and vice versa. If they both charge 2 cents, they will each earn \$7.5 billion. What is the Nash equilibrium?

		Azure	
		5 cents	2 cents
AWS	5 cents	10, 10	5, 12.5
	2 cents	12.5, 5	7.5, 7.5

- Both firms earned \$7.5 billion.
- Both firms earned \$10 billion.
- AWS earns \$12.5 billion, and Azure earns \$5 billion.
- AWS earns \$5 billion, and Azure earns \$12.5 billion.

Match 2 (Fall 2019: Spring 2022) *Hard*

F19

Table 6.

		Nintendo	
		Reduce Price	Don't reduce price
Sony	Reduce Price	\$20 million	\$10 million
	Don't reduce price	\$10 million	\$30 million
		\$20 million	\$40 million
		\$40 million	\$30 million

Refer to Table 6: What is the Nash Equilibrium?

- Both firms reduce their price.
- No firm reduces their price.
- Nintendo reduces prices and Sony does not.
- Sony does not reduce prices and Nintendo does.

S22

The following payoff matrix is for two players, each with two strategies:

[Note: Image reference in original document - Table showing game theory payoff matrix]

What is the Nash equilibrium of this game?

- Cheat and Cooperate
- Cheat and Cheat
- Cooperate and Cooperate
- Cooperate and Cheat

Match 3 (Fall 2019: Spring 2022) Hard

F19

Table 6.

Nintendo			
Sony	Reduce Price	Reduce Price	Don't reduce price
		\$20 million	\$10 million
	Don't reduce price	\$20 million	\$40 million
		\$10 million	\$30 million
		\$40 million	\$30 million

Refer to Table 6: What is the Nash Equilibrium?

- a) Both firms reduce their price.
- b) No firm reduces their price.
- c) Nintendo reduces prices and Sony does not.
- d) Sony does not reduce prices and Nintendo does.

S22

Consider the game depicted in the following table:

		Player 2	
		Strategy A	Strategy B
Player 1	Strategy 1	(9,3)	(2,4)
Player 1	Strategy 2	(6,5)	(5,6)

The payout for player 1 is given first in parenthesis, with Player 2's payout second.

What is the Nash equilibrium of this game?

- a) Strategy 1 and Strategy A
- b) Strategy 1 and Strategy B
- c) Strategy 2 and Strategy B
- d) This game does not have a Nash equilibrium.

Match 4 (Spring 2019: Fall 2020) Easy

S19

Scenario 1: A star-crossed cartel: There are only two wells in the town of Verona, owned by two families, the Montagues, and the Capulets. The wells are old, so there are no fixed costs, and each gallon of water costs nothing to draw. Each family draws water from their respective wells and sells it by the gallon to the town's citizens. Verona's demand for water, including sales revenue, is tabulated below.

Price per gallon	Gallons demanded daily	Total Revenue
\$ 6.00	0	\$ 0
\$ 5.50	25	\$ 137.50
\$ 5.00	50	\$ 250.00
\$ 4.50	75	\$ 337.50
\$ 4.00	100	\$ 400.00
\$ 3.50	125	\$ 437.50
\$ 3.00	150	\$ 450.00
\$ 2.50	175	\$ 437.50
\$ 2.00	200	\$ 400.00
\$ 1.50	225	\$ 337.50
\$ 1.00	250	\$ 250.00
\$ 0.50	275	\$ 137.50
\$ 0	300	\$ 0

Refer to Scenario 1: A star-crossed cartel. If the Montagues and Capulets were able to successfully operate as a cartel and jointly earn the monopoly profit, how many gallons would each family sell per day, and what would be the price of water in Verona?

- a) The price of water will be \$2.00 per gallon, and each family will sell 100 gallons.
- b) The price of water will be \$2.50 per gallon, and each family will sell 75 gallons.
- c) The price of water will be \$3.00 per gallon, and each family will sell 75 gallons.
- d) The price of water will be \$3.00 per gallon, and each family will sell 150 gallons.

F20

The following table presents the Demand Schedule and Profits for Smart Phones

Quantity	Price	Profit
0	\$1400	\$ 0
25	1300	275
50	1200	500
75	1100	675
100	1000	800
125	900	875

Quantity	Price	Profit
150	800	900
175	700	875
200	600	800
225	500	675
250	400	500
275	300	275
300	200	0

Suppose the market for smart phones is a duopoly and the two firms in the market are Apple and Samsung. Both Apple and Samsung make the same phones but with different names: iPhone and The Galaxy. Assume a constant marginal cost of \$200 and no fixed costs. If Apple and Samsung colluded, how many iPhones would Apple produce?

- a. 150
- b. 100
- c. 75
- d. 25

Match 5 (Spring 2019: Fall 2021) Easy

S19

Scenario 1: A star-crossed cartel: There are only two wells in the town of Verona, owned by two families, the Montagues, and the Capulets. The wells are old, so there are no fixed costs, and each gallon of water costs nothing to draw. Each family draws water from their respective wells and sells it by the gallon to the town's citizens. Verona's demand for water, including sales revenue, is tabulated below.

Price per gallon	Gallons demanded daily	Total Revenue
\$ 6.00	0	\$ 0
\$ 5.50	25	\$ 137.50
\$ 5.00	50	\$ 250.00
\$ 4.50	75	\$ 337.50
\$ 4.00	100	\$ 400.00
\$ 3.50	125	\$ 437.50
\$ 3.00	150	\$ 450.00
\$ 2.50	175	\$ 437.50
\$ 2.00	200	\$ 400.00
\$ 1.50	225	\$ 337.50
\$ 1.00	250	\$ 250.00
\$ 0.50	275	\$ 137.50
\$ 0	300	\$ 0

Price per gallon	Gallons demanded daily	Total Revenue
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Refer to *Scenario 1: A star-crossed cartel*. If the Montagues and Capulets were able to successfully operate as a cartel and jointly earn the monopoly profit, how many gallons would each family sell per day, and what will be the price of water in Verona?

- e) The price of water will be \$2.00 per gallon, and each family will sell 100 gallons.
- f) The price of water will be \$2.50 per gallon, and each family will sell 75 gallons.
- g) The price of water will be \$3.00 per gallon, and each family will sell 75 gallons.
- h) The price of water will be \$3.00 per gallon, and each family will sell 150 gallons.

F21

The following table presents the demand schedule and profits for soft drinks.

Quantity	Price	Profit
0	\$1400	\$ 0
25	1300	275
50	1200	500
75	1100	675
100	1000	800
125	900	875
150	800	900
175	700	875
200	600	800
225	500	675
250	400	500
275	300	275
300	200	0

Suppose the market for soft drinks is a duopoly and the two firms in the market are Coca Cola and Pepsi. Assume Coca Cola and Pepsi make the same soft drinks but with different names: Coke and Pepsi. Assume a constant marginal cost of \$200 and no fixed costs. If Coca Cola and Pepsi collude, how many Cokes would Coca Cola produce?

- a) 25
- b) 75
- c) 100
- d) 150

Match 6 (Fall 2019: Fall 2020) Easy

F19

Table 1: Assume that France and Italy can switch between producing cheese and producing wine at a constant rate.

	Labor Hours Needed to Make 1 Unit of		Number of Units Produced in 40 Hours	
	Cheese	Wine	Cheese	Wine
France	1	4	40	10
Italy	4	8	10	5

Refer to Table 1: Which country has an absolute advantage in making Cheese and which country has a comparative advantage in making Cheese?

- a) France, France
- b) France, Italy
- c) Italy, Italy
- d) Italy, France

F20

The table below presents the total output Factory A and Factory B can produce in one hour. Consider that Factory A and Factory B can switch between producing couches and producing beds at a constant rate. Assume that factory A and factory B, each has a 4-hour production day. Originally, each factory divided its time equally between the production of couches and beds. Now, each factory spends all its time producing the good in which it has a comparative advantage. As a result, the total output of beds increased by

	Output Produced in One Hour	
	Couches	Beds
Factory A	12	6
Factory B	24	3

- a) 6
- b) 12
- c) 3
- d) 9

Match 7 (Fall 2019: Spring 2021) Easy

F19

Table 1: Assume that France and Italy can switch between producing cheese and producing wine at a constant rate.

	Labor Hours Needed to Make 1 Unit of		Number of Units Produced in 40 Hours	
	Cheese	Wine	Cheese	Wine
France	1	4	40	10
Italy	4	8	10	5

Refer to Table 1: Which country has an absolute advantage in making Cheese and which country has a comparative advantage in making Cheese?

- a) France, France
- b) France, Italy
- c) Italy, Italy
- d) Italy, France

S21

Assume that Australia and New Zealand can switch between producing coal and producing milk at a constant rate. The following table shows the tons of coal or the tons of milk each country can produce in one year. Which of the following is a plausible trading outcome between the two countries?

- a) New Zealand exports milk and imports coal at a rate of 100 tons of coal for 1 ton of milk.
- b) Australia exports milk and imports coal at a rate of 100 tons of coal for 1 ton of milk.
- c) New Zealand exports milk and imports coal at a rate of 300 tons of coal for 1 ton of milk.
- d) Australia exports milk and imports coal at a rate of 300 tons of coal for 1 ton of milk.

Match 8 (Fall 2019: Fall 2020) Easy

F19

Table 1: Assume that France and Italy can switch between producing cheese and producing wine at a constant rate.

	Labor Hours Needed to Make 1 Unit of		Number of Units Produced in 40 Hours	
	Cheese	Wine	Cheese	Wine
France	1	4	40	10
Italy	4	8	10	5

Refer to the Table 1: Italy should export

- a) wine and import cheese.
- b) neither good and import both goods.
- c) both goods and import neither good.
- d) cheese and import wine.

F20

The table below presents the total output Factory A and Factory B can produce in one hour. Consider that Factory A and Factory B can switch between producing couches and producing beds at a constant rate. Assume that factory A and factory B, each has a 4-hour production day. Originally, each factory divided its time equally between the production of couches and beds. Now, each factory spends all its time producing the good in which it has a comparative advantage. As a result, the total output of beds increased by

- a) 6
- b) 12
- c) 3
- d) 9

Match 9 (Fall 2019: Spring 2021) Easy

F19

Table 1: Assume that France and Italy can switch between producing cheese and producing wine at a constant rate.

	Labor Hours Needed to Make 1 Unit of		Number of Units Produced in 40 Hours	
	Cheese	Wine	Cheese	Wine
France	1	4	40	10
Italy	4	8	10	5

Refer to the Table 1: Italy should export

- a) wine and import cheese.
- b) neither good and import both goods.
- c) both goods and import neither good.
- d) cheese and import wine.

S21

Assume that Australia and New Zealand can switch between producing coal and producing milk at a constant rate. The following table shows the tons of coal or the tons of milk each country can produce in one year. Which of the following is a plausible trading outcome between the two countries?

- a) New Zealand exports milk and imports coal at a rate of 100 tons of coal for 1 ton of milk.
- b) Australia exports milk and imports coal at a rate of 100 tons of coal for 1 ton of milk.
- c) New Zealand exports milk and imports coal at a rate of 300 tons of coal for 1 ton of milk.
- d) Australia exports milk and imports coal at a rate of 300 tons of coal for 1 ton of milk.

Match 10 (Fall 2019: Fall 2020) Easy

F19

Scenario 2, Monopoly: Let the following equations the market for energy for ConEd, a monopolist:

$$[P = 56 - 2Q]$$

$$[MR = 56 - 4Q]$$

$$[TC = 50 + 6Q + 3Q^2]$$

$$[MC = 6 + 6Q]$$

Refer to Scenario 2, Monopoly: What is the profit maximizing quantity for ConEd?

- a) 3.00
- b) 4.75
- c) 5.00
- d) 6.25

F20

A monopolist has a total cost curve represented by $(TC=50+2Q+Q^2)$, and a marginal cost curve represented by $(MC=2+2Q)$. The monopolist faces the demand curve $(P=100-3Q)$. The price is in dollars and the quantity is in thousands. What is the monopolist's profit? (pick the closest answer)

- a) \$330,330
- b) \$550,250

- c) \$750,000
 - d) \$1,000,600
-

Match 11 (Fall 2019: Fall 2020) Hard

F19

Scenario 2, Monopoly: Let the following equations the market for energy for ConEd, a monopolist:

$$[P = 56 - 2Q]$$

$$[MR = 56 - 4Q]$$

$$[TC = 50 + 6Q + 3Q^2]$$

$$[MC = 6 + 6Q]$$

Refer to Scenario 2, Monopoly: What is the profit of ConEd at the profit maximizing quantity? (round to the nearest whole number and pick the best answer)

- a) 100
- b) 50
- c) 75
- d) 155

F20

A monopolist has a total cost curve represented by $(TC = 50 + 2Q + Q^2)$, and a marginal cost curve represented by $(MC = 2 + 2Q)$. The monopolist faces the demand curve $(P = 100 - 3Q)$. The price is in dollars and the quantity is in thousands. What is the monopolist's profit? (pick the closest answer)

- a) \$330,330
 - b) \$550,250
 - c) \$750,000
 - d) \$1,000,600
-

Match 12 (Spring 2019: Spring 2021) Easy

S19

Scenario 2: Suppose a monopolist has a demand curve that can be expressed as $(P=90-Q)$. The monopolist has constant marginal costs and average total costs of \$10.

Refer to Scenario 2. The profit-maximizing monopolist will produce an output level of

- a) 80 units.
- b) 40 units.
- c) 20 units.
- d) 10 units.

S21

Suppose a monopolist has a demand curve that can be expressed as $(P=100-Q)$. Monopolist's marginal revenue is given by $(MR=100-2Q)$. The monopolist has a constant marginal cost and has a constant average total cost of \$20. The profit-maximizing monopolist will produce an output level of

- a) 40 units.
 - b) 60 units.
 - c) 70 units.
 - d) 80 units.
-

Match 13 (Spring 2019: Spring 2021) Easy

S19

[Note: Image reference in original document - Graph showing cost curves]

Refer to Figure 4. What is the exit price of the firm in the long run?

- a) \$3
- b) \$5
- c) \$8
- d) \$10

S21

Refer to Figure 14-1. The firm should shut down if the market price is

- a) above \$6 but less than \$13.
 - b) less than \$6.
 - c) above \$6 but less than \$18.
 - d) above \$13.
-

Match 14 (Fall 2019: Fall 2021) Hard

F19

Table 6.

		Nintendo	
Sony	Reduce Price	Reduce Price \$20 million	Don't reduce price \$10 million
	Don't reduce price	\$20 million \$10 million	\$40 million \$30 million

Refer to Table 6: What is the Nash Equilibrium?

- e) Both firms reduce their price.
- f) No firm reduces their price.
- g) Nintendo reduces prices and Sony does not.
- h) Sony does not reduce prices and Nintendo does.

F21

[Note: Image reference in original document - Game theory payoff matrix]

The Nash equilibrium in this game is:

- a) $Q = 6$ for the firm A and $Q = 6$ for the firm B.
- b) $Q = 5$ for the firm A and $Q = 5$ for the firm B.
- c) $Q = 5$ for the firm A and $Q = 6$ for the firm B.
- d) $Q = 6$ for the firm A and $Q = 5$ for the firm B.

Match 15 (Fall 2019: Fall 2021) Easy

F19

Scenario 2, Monopoly: Let the following equations the market for energy for ConEd, a monopolist:

$$[P = 56 - 2Q]$$

$$[MR = 56 - 4Q]$$

$$[TC = 50 + 6Q + 3Q^2]$$

$$[MC = 6 + 6Q]$$

Refer to Scenario 2, Monopoly: What is the profit maximizing quantity for ConEd?

- a) 3.00
- b) 4.75
- c) 5.00
- d) 6.25

F21

Alex Potter owns the only well in a town that produces clean drinking water. He faces the following demand ($P=100-Q$), and marginal cost ($MC=20+2Q$), marginal revenue ($MR=100-2Q$) curves. To maximize profits, Alex should charge a price of

- a) \$60 at the profit maximizing quantity with a marginal revenue equal to \$60.
- b) \$60 at the profit maximizing quantity with a marginal revenue equal to \$80.
- c) \$80 at the profit maximizing quantity with a marginal revenue equal to \$60.
- d) \$80 at the profit maximizing quantity with a marginal revenue equal to \$80.

Match 16 (Fall 2019: Fall 2021) Easy

F19

Assume lawyer services have an elasticity of demand of 0.6 in absolute value. Currently a lawyer charges \$300 per hour, and she sees 100 clients per week. If she raises her hourly rate to \$450 an hour, a 50% increase, her revenue will... (use point elasticity not the midpoint formula)

- a) fall from \$30,000 per week to \$28,500 per week.
- b) rise from \$30,000 per week to \$31,500 per week.
- c) rise from \$30,000 per week to \$34,000 per week
- d) fall from \$30,000 per week to \$26,000 per week

F21

Assume lawyer services have an elasticity of demand of 0.5 in absolute value. Currently, a lawyer charges \$300 per consultation, and she has 100 consultations per week. If she raises her rate to \$450 per consultation (a 50% increase) her revenue will (use the general formula for elasticity not the midpoint formula)

- a) fall from \$30,000 per week to \$28,500 per week.
 - b) rise from \$30,000 per week to \$31,500 per week
 - c) rise from \$30,000 per week to \$33,750 per week
 - d) fall from \$30,000 per week to \$26,000 per week
-

Match 17 (Fall 2019: Fall 2021) Easy

F19

Scenario 1: Beer Sales in New York City: The table below shows a representative consumer's willingness to pay for a six-pack of beer. Assume the supply of beer is perfectly elastic.

- First pack: \$16
- Second pack: \$12
- Third pack: \$10
- Fourth pack: \$8
- Fifth pack: \$5

Refer to Scenario 1: Beer Sales in New York City: If in the cost per six-pack is \$7 how many packs does each person buy and what is her consumer surplus (CS) assuming NO negative externalities exist from the consumption of beer.

- a) 4 packs, CS=\$20
- b) 3 packs, CS=\$17
- c) 4 packs, CS=\$18
- d) 4 packs, CS=\$19

F21

The table below shows each smoker's willingness to pay for a pack of cigarettes (each smoker's WTP schedule is identical to the others).

- First pack: \$20
- Second pack: \$15
- Third pack: \$10
- Fourth pack: \$8
- Fifth pack: \$5

If the price per pack is \$9 (assume the supply curve is perfectly elastic), how many packs did each smoker buy and what is her consumer surplus (CS)?

- a) 3 packs and CS=\$20
 - b) 3 packs and CS=\$25
 - c) 3 packs and CS=\$18
 - d) 4 packs and CS=\$17
-

Match 18 (Fall 2019: Fall 2021) Hard

F19

Table 5, Fishy Friends: *Honey Bee* and *Chicken of the Ocean* are two firms in the canned fish market. Each firm must decide on a pricing strategy. Their potential profits are presented in the payoff matrix below.

		Chicken of the Ocean	
		High Price	Low Price
Honey Bee	High Price	\$10,000, \$10,000	\$7,000, \$9,000
Honey Bee	Low Price	\$14,000, \$5,000	\$9,000, \$8,000

Refer to Table 5, Fishy Friends: Which of the following statements is true.

- a) Chicken of the Ocean has a dominant strategy but Honey Bee does not.
- b) Chicken of the Ocean does not have a dominant strategy, but Honey Bee does.
- c) Chicken of the Ocean and Honey Bee both have dominant strategies.
- d) Chicken of the Ocean and Honey Bee do not have a dominant strategy.

F21

[Note: Image reference in original document - Payoff matrix for Pinnacle and Acme]

Which of the following statements is correct?

- a) Neither Pinnacle nor Acme have a dominant strategy.
- b) Pinnacle's dominant strategy is to produce Poor quality products, but Acme's dominant strategy is to produce good quality products.
- c) Pinnacle's dominant strategy is to produce *Good* quality products, but Acme's dominant strategy is to produce Poor quality products.
- d) The dominant strategy for both companies is to produce Good-quality products.

Match 19 (Fall 2019: Fall 2021) Hard

F19

Table 5, Fishy Friends: *Honey Bee* and *Chicken of the Ocean* are two firms in the canned fish market. Each firm must decide on a pricing strategy. Their potential profits are presented in the payoff matrix below.

Chicken of the Ocean		
	High Price	Low Price
Honey Bee High Price	\$10,000, \$10,000	\$7,000, \$9,000
Honey Bee Low Price	\$14,000, \$5,000	\$9,000, \$8,000

Refer to Table 5, Fishy Friends: Which of the following statements is true.

- a) Chicken of the Ocean has a dominant strategy, but Honey Bee does not.
- b) Chicken of the Ocean does not have a dominant strategy, but Honey Bee does.
- c) Chicken of the Ocean and Honey Bee both have dominant strategies.
- d) Chicken of the Ocean and Honey Bee do not have a dominant strategy.

F21

Apple and Samsung control the majority of Smart Phones. Suppose the diagram below represents their strategic options, either to offer an expensive or a cheap phone in the market. If both firms offer an expensive phone, they will each earn 4 billion dollars. If Samsung offers a cheap phone, while Apple offers only an expensive phone, Samsung will earn \$6 billion and Apple will earn \$2 billion, and vice versa. If they both offer a cheap phone, they will each earn \$3 billion. What is each firm's dominant strategy?

[Note: Image reference in original document - Payoff matrix for Apple and Samsung]

- a) The dominant strategy for Apple is to offer an expensive phone, but Samsung does not have a dominant strategy.
- b) The dominant strategy for Apple is to offer a cheap phone, but Samsung does not have a dominant strategy.
- c) The dominant strategy for both firms is to offer an expensive phone.
- d) The dominant strategy for both firms is to offer a cheap phone.

Match 20 (Spring 2019: Fall 2021) Easy

S19

Scenario 2: Suppose a monopolist has a demand curve that can be expressed as $(P=90-Q)$. The monopolist has constant marginal costs and average total costs of \$10.

Refer to *Scenario 2*. The profit-maximizing monopolist will produce an output level of

- a) 80 units.
- b) 40 units.
- c) 20 units.
- d) 10 units.

F21

Alex Potter owns the only well in a town that produces clean drinking water. He faces the following demand ($P=100-Q$), and marginal cost ($MC=20+2Q$), marginal revenue ($MR=100-2Q$) curves. In order to maximize profits, Alex should charge a price of

- a) \$60 at the profit maximizing quantity with a marginal revenue equal to \$60.
- b) \$60 at the profit maximizing quantity with a marginal revenue equal to \$80.
- c) \$80 at the profit maximizing quantity with a marginal revenue equal to \$60.
- d) \$80 at the profit maximizing quantity with a marginal revenue equal to \$80.

Match 21 (Spring 2019: Fall 2021) Hard

S19

Refer to Table 3: Christie's and Sotheby's. Each cell of this table presents the revenues earned by the auction houses, Christie's and Sotheby's. Revenues are based on the type of commission each firm charges its clients, as well as what commission the other charges. Christie's revenues are listed first in each cell, then Sotheby's. Christie's dominant strategy is _____ commission and Sotheby's dominant strategy is _____ commission.

Table 3: Christie's and Sotheby's

	Sotheby's Strategies	
	High Commission	Low Commission
Christie's strategies High Commission	\$4 million, \$4 million	\$2 million, \$6 million
Christie's strategies Low Commission	\$6 million, \$2 million	\$3 million, \$3 million

- a) high; high
- b) high; low
- c) low; high
- d) low; low

F21

[Note: Image reference in original document - Payoff matrix for Pinnacle and Acme]

Which of the following statements is correct?

- a) Neither Pinnacle nor Acme have a dominant strategy.
- b) Pinnacle's dominant strategy is to produce Poor quality products, but Acme's dominant strategy is to produce good quality products.

- c) Pinnacle's dominant strategy is to produce *Good* quality products, but Acme's dominant strategy is to produce *Poor* quality products.
- d) The dominant strategy for both companies is to produce *Good-quality* products.

Match 22 (Spring 2019: Fall 2021) Hard

S19

Refer to Table 3: Christie's and Sotheby's. Each cell of this table presents the revenues earned by the auction houses, Christie's and Sotheby's. Revenues are based on the type of commission each firm charges its clients, as well as what commission the other charges. Christie's revenues are listed first in each cell, then Sotheby's. Christie's dominant strategy is _____ commission and Sotheby's dominant strategy is _____ commission.

Table 3: Christie's and Sotheby's

	Sotheby's Strategies	
	High Commission	Low Commission
Christie's strategies	\$4 million, \$4 million	\$2 million, \$6 million
High Commission		
Christie's strategies	\$6 million, \$2 million	\$3 million, \$3 million
Low Commission		

- a) high; high
- b) high; low
- c) low; high
- d) low; low

F21

Apple and Samsung control the majority of Smart Phones. Suppose the diagram below represents their strategic options, either to offer an expensive or a cheap phone in the market. If both firms offer an expensive phone, they will each earn 4 billion dollars. If Samsung offers a cheap phone, while Apple offers only an expensive phone, Samsung will earn \$6 billion and Apple will earn \$2 billion, and vice versa. If they both offer a cheap phone, they will each earn \$3 billion. What is each firm's dominant strategy?

[Note: Image reference in original document - Payoff matrix for Apple and Samsung]

- a) The dominant strategy for Apple is to offer an expensive phone, but Samsung does not have a dominant strategy.
- b) The dominant strategy for Apple is to offer a cheap phone, but Samsung does not have a dominant strategy.
- c) The dominant strategy for both firms is to offer an expensive phone.

- d) The dominant strategy for both firms is to offer a cheap phone.

Match 23 (Fall 2019: Spring 2022) Hard

F19

Table 5, Fishy Friends: *Honey Bee* and *Chicken of the Ocean* are two firms in the canned fish market. Each firm must decide on a pricing strategy. Their potential profits are presented in the payoff matrix below.

		Chicken of the Ocean	
		High Price	Low Price
Honey Bee	High Price	\$10,000, \$10,000	\$7,000, \$9,000
Honey Bee	Low Price	\$14,000, \$5,000	\$9,000, \$8,000

Refer to Table 5, Fishy Friends: Which of the following statements is true.

- a) Chicken of the Ocean has a dominant strategy, but Honey Bee does not.
- b) Chicken of the Ocean does not have a dominant strategy, but Honey Bee does.
- c) Chicken of the Ocean and Honey Bee both have dominant strategies.
- d) Chicken of the Ocean and Honey Bee do not have a dominant strategy.

S22

Consider the game depicted in the following table:

		Player 2	
		Strategy A	Strategy B
Player 1	Strategy 1	(9,3)	(2,4)
Player 1	Strategy 2	(6,5)	(5,6)

The payout for player 1 is given first in parenthesis, with Player 2's payout second. Does either player have a dominant strategy?

- a) Player one has a dominant strategy.
 - b) Player two has a dominant strategy.
 - c) Both players have a dominant strategy.
 - d) Neither player has a dominant strategy.
-

Match 24 (Fall 2019: Spring 2022) Hard

F19

Table 6.

Nintendo			
Sony	Reduce Price	Reduce Price	Don't reduce price
		\$20 million	\$10 million
	Don't reduce price	\$20 million	\$40 million
		\$10 million	\$30 million
		\$40 million	\$30 million

Refer to Table 6: What is the Nash Equilibrium?

- a) Both firms reduce their price.
- b) No firm reduces their price.
- c) Nintendo reduces prices and Sony does not.
- d) Sony does not reduce prices and Nintendo does.

S22

Consider the game depicted in the following table:

		Player 2	
		Strategy A	Strategy B
Player 1	Strategy 1	(9,3)	(2,4)
	Strategy 2	(6,5)	(5,6)

The payout for player 1 is given first in parenthesis, with Player 2's payout second.

What is the Nash equilibrium of this game?

- a) Strategy 1 and Strategy A
- b) Strategy 1 and Strategy B
- c) Strategy 2 and Strategy B
- d) This game does not have a Nash equilibrium.

Match 25 (Fall 2019: Spring 2022) Hard

F19

Table 6.

Nintendo			
Sony	Reduce Price	Reduce Price	Don't reduce price
		\$20 million	\$10 million
	Don't reduce price	\$20 million	\$40 million
		\$10 million	\$30 million
		\$40 million	\$30 million

Refer to Table 6: What is the Nash Equilibrium?

- a) Both firms reduce their price.
- b) No firm reduces their price.
- c) Nintendo reduces prices and Sony does not.
- d) Sony does not reduce prices and Nintendo does.

S22

The following payoff matrix is for two players, each with two strategies:

[Note: Image reference in original document - Table showing game theory payoff matrix]

What is the Nash equilibrium of this game?

- a) Cheat and Cooperate
- b) Cheat and Cheat
- c) Cooperate and Cooperate
- d) Cooperate and Cheat

Match 26 (Fall 2019: Spring 2022) Hard

F19

Table 5, Fishy Friends: Honey Bee and Chicken of the Ocean are two firms in the canned fish market. Each firm must decide on a pricing strategy. Their potential profits are presented in the payoff matrix below.

		Chicken of the Ocean	
		High Price	Low Price

Chicken of the Ocean			
Honey Bee	High Price	\$10,000, \$10,000	\$7,000, \$9,000
Honey Bee	Low Price	\$14,000, \$5,000	\$9,000, \$8,000

Refer to Table 5, Fishy Friends: Is there a Nash Equilibrium?

- a) Yes both firms charge the high price
- b) Yes, both firms charge the low price
- c) No, because Honey Bee should always make \$14,000
- d) No, because Chicken of the Ocean's best strategy is to charge a high price

S22

Consider the game depicted in the following table:

		Player 2	
		Strategy A	Strategy B
Player 1	Strategy 1	(9,3)	(2,4)
	Strategy 2	(6,5)	(5,6)

The payout for player 1 is given first in parenthesis, with Player 2's payout second.

What is the Nash equilibrium of this game?

- a) Strategy 1 and Strategy A
- b) Strategy 1 and Strategy B
- c) Strategy 2 and Strategy B
- d) This game does not have a Nash equilibrium.

Match 27 (Fall 2019: Spring 2022) Easy

F19

Scenario 2, Monopoly: Let the following equations the market for energy for ConEd, a monopolist:

$$[P = 56 - 2Q]$$

$$[MR = 56 - 4Q]$$

$$[TC = 50 + 6Q + 3Q^2]$$

$$[MC = 6 + 6Q]$$

Refer to Scenario 2, Monopoly: What is the profit maximizing quantity for ConEd?

- a) 3.00
- b) 4.75
- c) 5.00
- d) 6.25

S22

The following equations describe the monopolist's demand, marginal revenue, total cost, and the marginal cost:

[Note: Image reference in original document]

What is the monopolist's profit?

- a) \$10.50
- b) \$7.50
- c) \$15.00
- d) \$8.00

Match 28 (Fall 2019: Spring 2022) Hard

F19

Scenario 2, Monopoly: Let the following equations the market for energy for ConEd, a monopolist:

$$[P = 56 - 2Q]$$

$$[MR = 56 - 4Q]$$

$$[TC = 50 + 6Q + 3Q^2]$$

$$[MC = 6 + 6Q]$$

Refer to Scenario 2, Monopoly: What is the profit of ConEd at the profit maximizing quantity? (round to the nearest whole number and pick the best answer)

- a) 100
- b) 50
- c) 75
- d) 155

S22

The following equations describe the monopolist's demand, marginal revenue, total cost, and the marginal cost:

[Note: Image reference in original document]

What is the monopolist's profit?

- a) \$10.50
 - b) \$7.50
 - c) \$15.00
 - d) \$8.00
-

Match 29 (Fall 2019: Spring 2022) Hard

F19

Scenario 2, Monopoly: Let the following equations the market for energy for ConEd, a monopolist:

$$[P = 56 - 2Q]$$

$$[MR = 56 - 4Q]$$

$$[TC = 50 + 6Q + 3Q^2]$$

$$[MC = 6 + 6Q]$$

Refer to Scenario 2, Monopoly: What is the deadweight loss at the profit maximizing quantity?

- a) \$15.00
- b) \$12.50
- c) \$6.25
- d) \$10.00

S22

The following equations describe the monopolist's demand, marginal revenue, and the marginal cost:

Demand: $(P = 120 - Q)$

Marginal Revenue: $(MR = 120 - 2Q)$

Marginal Cost: $(MC = 30 + Q)$

If the monopolist produces at the profit-maximizing output, the deadweight loss for the market equals

- a) \$300.
 - b) \$400.
 - c) \$225.
 - d) \$600.
-

Match 30 (Fall 2019: Spring 2022) Easy

F19

Scenario 5: Imagine a small town in which only two residents, Kevin and Russell, own wells that produce safe drinking water. Each week Kevin and Russell work together to decide how many gallons of water to pump. They bring the water to town and sell it at whatever price the market will bear. To keep things simple, suppose that Kevin and Russell can pump as much water as they want without cost so that the marginal cost of water equals zero. The weekly town demand schedule and total revenue schedule for water is shown in the table below:

Quantity (in gallons)	Price	Total Revenue (and Total Profit)
0	\$600	\$0
50	550	27,500
100	500	50,000
150	450	67,500
200	400	80,000
250	350	87,500
300	300	90,000
350	250	87,500
400	200	80,000
450	150	67,500
500	100	50,000
550	50	27,500
600	0	0

Refer to Scenario 5: If Kevin and Russell operate as a profit-maximizing monopoly in the market for water, how much profit will *each* of them earn?

- a) \$8,750
- b) \$9,000
- c) \$45,000
- d) \$18,000

S22

A certain rural village has numerous small farms which raise livestock. There are two large and equally sized landowners, Jimmy and Bob, which produce hay for the farmers' animals. Below is the daily village demand for hay:

Quantity (in bales)	Price	Total Revenue
0	\$10	\$0
50	\$9	\$450
100	\$8	\$800

Quantity (in bales)	Price	Total Revenue
150	\$7	\$1,050
200	\$6	\$1,200
250	\$5	\$1,250
300	\$4	\$1,200
350	\$3	\$1,050
400	\$2	\$800
450	\$1	\$450
500	\$0	\$0

Suppose, for simplicity, that Jimmy and Bob have the same constant cost structure, so maximizing total revenue maximizes profit. If Jimmy and Bob can form a cartel and collude without cheating on each other, what will be the price per bale of hay in the village?

- a) \$6
- b) \$5
- c) \$4
- d) \$3

Match 31 (Fall 2019: Spring 2022) Hard

F19

Scenario 5: Imagine a small town in which only two residents, Kevin and Russell, own wells that produce safe drinking water. Each week Kevin and Russell work together to decide how many gallons of water to pump. They bring the water to town and sell it at whatever price the market will bear. To keep things simple, suppose that Kevin and Russell can pump as much water as they want without cost so that the marginal cost of water equals zero. The weekly town demand schedule and total revenue schedule for water is shown in the table below:

Quantity (in gallons)	Price	Total Revenue (and Total Profit)
0	\$600	\$0
50	550	27,500
100	500	50,000
150	450	67,500
200	400	80,000
250	350	87,500
300	300	90,000
350	250	87,500
400	200	80,000
450	150	67,500
500	100	50,000

Quantity (in gallons)	Price	Total Revenue (and Total Profit)
550	50	27,500
600	0	0

Refer to Scenario 5: Suppose antitrust laws are enacted that prevent Kevin and Russell from operating as a monopoly. What is the price after Kevin and Russell reach a Nash equilibrium (they can only increase or decrease production by 50 gallons)?

- a) \$300
- b) \$200
- c) \$100
- d) \$0

S22

A certain rural village has numerous small farms which raise livestock. There are two large and equally sized landowners, Jimmy and Bob, which produce hay for the farmers' animals. Below is the daily village demand for hay:

Quantity (in bales)	Price	Total Revenue
0	\$10	\$0
50	\$9	\$450
100	\$8	\$800
150	\$7	\$1,050
200	\$6	\$1,200
250	\$5	\$1,250
300	\$4	\$1,200
350	\$3	\$1,050
400	\$2	\$800
450	\$1	\$450
500	\$0	\$0

Suppose, for simplicity, that Jimmy and Bob have the same constant cost structure, so maximizing total revenue maximizes profit. If Jimmy and Bob initially form a cartel, but subsequently succumb to the temptation to cheat on each other, what will be the Nash equilibrium?

- a) Jimmy and Bob will each earn a daily profit of \$625.
- b) Jimmy will earn a daily profit of \$700, and Bob will earn a daily profit of \$500.
- c) Bob will earn a daily profit of \$700, and Jimmy will earn a daily profit of \$500.
- d) Jimmy and Bob will each earn a daily profit of \$525.

Match 32 (Spring 2019: Spring 2022) Easy

S19

Scenario 1: A star-crossed cartel: There are only two wells in the town of Verona, owned by two families, the Montagues, and the Capulets. The wells are old, so there are no fixed costs, and each gallon of water costs nothing to draw. Each family draws water from their respective wells and sells it by the gallon to the town's citizens. Verona's demand for water, including sales revenue, is tabulated below.

Price per gallon	Gallons demanded daily	Total Revenue
\$ 6.00	0	\$ 0
\$ 5.50	25	\$ 137.50
\$ 5.00	50	\$ 250.00
\$ 4.50	75	\$ 337.50
\$ 4.00	100	\$ 400.00
\$ 3.50	125	\$ 437.50
\$ 3.00	150	\$ 450.00
\$ 2.50	175	\$ 437.50
\$ 2.00	200	\$ 400.00
\$ 1.50	225	\$ 337.50
\$ 1.00	250	\$ 250.00
\$ 0.50	275	\$ 137.50
\$ 0	300	\$ 0

Refer to Scenario 1: A star-crossed cartel. If the Montagues and Capulets were able to successfully operate as a cartel and jointly earn the monopoly profit, how many gallons would each family sell per day, and what would be the price of water in Verona?

- a) The price of water will be \$2.00 per gallon, and each family will sell 100 gallons.
- b) The price of water will be \$2.50 per gallon, and each family will sell 75 gallons.
- c) The price of water will be \$3.00 per gallon, and each family will sell 75 gallons.
- d) The price of water will be \$3.00 per gallon, and each family will sell 150 gallons.

S22

A certain rural village has numerous small farms which raise livestock. There are two large and equally sized landowners, Jimmy and Bob, which produce hay for the farmers' animals. Below is the daily village demand for hay:

Quantity (in bales)	Price	Total Revenue
0	\$10	\$0
50	\$9	\$450
100	\$8	\$800
150	\$7	\$1,050

Quantity (in bales)	Price	Total Revenue
200	\$6	\$1,200
250	\$5	\$1,250
300	\$4	\$1,200
350	\$3	\$1,050
400	\$2	\$800
450	\$1	\$450
500	\$0	\$0

Suppose, for simplicity, that Jimmy and Bob have the same constant cost structure, so maximizing total revenue maximizes profit. If Jimmy and Bob can form a cartel and collude without cheating on each other, what will be the price per bale of hay in the village?

- a) \$6
- b) \$5
- c) \$4
- d) \$3

Match 33 (Spring 2019: Spring 2022) Hard

S19

Scenario 1: A star-crossed cartel: There are only two wells in the town of Verona, owned by two families, the Montagues, and the Capulets. The wells are old, so there are no fixed costs, and each gallon of water costs nothing to draw. Each family draws water from their respective wells and sells it by the gallon to the town's citizens. Verona's demand for water, including sales revenue, is tabulated below.

Price per gallon	Gallons demanded daily	Total Revenue
\$ 6.00	0	\$ 0
\$ 5.50	25	\$ 137.50
\$ 5.00	50	\$ 250.00
\$ 4.50	75	\$ 337.50
\$ 4.00	100	\$ 400.00
\$ 3.50	125	\$ 437.50
\$ 3.00	150	\$ 450.00
\$ 2.50	175	\$ 437.50
\$ 2.00	200	\$ 400.00
\$ 1.50	225	\$ 337.50
\$ 1.00	250	\$ 250.00
\$ 0.50	275	\$ 137.50
\$ 0	300	\$ 0

Refer to *Scenario 1: A star-crossed cartel*. It does not take the Montague family long to realize the Capulets have cheated on the cartel agreement. What is the Nash equilibrium of this scenario?

- a) The Capulets' profit is \$250 and the Montagues' profit is \$150.
- b) The Capulets' profit is \$150 and the Montagues' profit is \$187.50.
- c) Each family has a profit of \$225.
- d) Each family has a profit of \$200.

S22

A certain rural village has numerous small farms which raise livestock. There are two large and equally sized landowners, Jimmy and Bob, which produce hay for the farmers' animals. Below is the daily village demand for hay:

Quantity (in bales)	Price	Total Revenue
0	\$10	\$0
50	\$9	\$450
100	\$8	\$800
150	\$7	\$1,050
200	\$6	\$1,200
250	\$5	\$1,250
300	\$4	\$1,200
350	\$3	\$1,050
400	\$2	\$800
450	\$1	\$450
500	\$0	\$0

Suppose, for simplicity, that Jimmy and Bob have the same constant cost structure, so maximizing total revenue maximizes profit. If Jimmy and Bob initially form a cartel, but subsequently succumb to the temptation to cheat on each other, what will be the Nash equilibrium?

- a) Jimmy and Bob will each earn a daily profit of \$625.
- b) Jimmy will earn a daily profit of \$700, and Bob will earn a daily profit of \$500.
- c) Bob will earn a daily profit of \$700, and Jimmy will earn a daily profit of \$500.
- d) Jimmy and Bob will each earn a daily profit of \$525.

Match 34 (Spring 2019: Spring 2022) Easy

S19

[Note: Image reference in original document - Graph showing cost curves]

Refer to Figure 4. What is the exit price of the firm in the long run?

- a) \$3
- b) \$5
- c) \$8
- d) \$10

S22

Suppose a firm operating in a competitive market has the following cost curves:

[Note: Image reference in original document - Diagram showing cost curves]

Which of the following prices is the shutdown price?

- a) P1
- b) P2
- c) P3
- d) P4

Match 35 (Spring 2019: Spring 2022) Hard

S19

Refer to Table 3: Christie's and Sotheby's. Each cell of this table presents the revenues earned by the auction houses, Christie's and Sotheby's. Revenues are based on the type of commission each firm charges its clients, as well as what commission the other charges. Christie's revenues are listed first in each cell, then Sotheby's. Christie's dominant strategy is _____ commission and Sotheby's dominant strategy is _____ commission.

Table 3: Christie's and Sotheby's

	Sotheby's Strategies	
	High Commission	Low Commission
Christie's strategies High Commission	\$4 million, \$4 million	\$2 million, \$6 million
Christie's strategies Low Commission	\$6 million, \$2 million	\$3 million, \$3 million

- a) high; high
- b) high; low
- c) low; high
- d) low; low

S22

Consider the game depicted in the following table:

		Player 2	
		Strategy A	Strategy B
Player 1	Strategy 1	(9,3)	(2,4)
Player 1	Strategy 2	(6,5)	(5,6)

The payout for player 1 is given first in parenthesis, with Player 2's payout second. Does either player have a dominant strategy?

- a) Player one has a dominant strategy.
- b) Player two has a dominant strategy.
- c) Both players have a dominant strategy.
- d) Neither player has a dominant strategy.

Notes

- Some questions reference images or figures from the original document that are noted as image references.
- All 35 matched question pairs are included showing the exam questions from before (F19/S19) and during (F20/F21/S21/S22) the COVID-19 pandemic period at Baruch College.
- Questions are categorized by difficulty level (Easy or Hard) as indicated in the original document.