1. -/1 pointsBerrFinMath1 8.2.001.

(1)

For the game and mixed strategies, find the expected value.

Let $G = \begin{pmatrix} 2 & -7 \\ 5 & 4 \end{pmatrix}$, $r = \begin{pmatrix} \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ and $c = \begin{pmatrix} \frac{1}{2} \\ \frac{1}{2} \end{pmatrix}$

Need Help? Read It | Watch It | Talk to a Tutor

Show My Work (Optional)

---

2. -/1 pointsBerrFinMath1 8.2.002.

For the game and mixed strategies, find the expected value.

Let $G = \begin{pmatrix} 3 & -4 \\ -1 & 2 \end{pmatrix}$, $r = \begin{pmatrix} \frac{3}{5} & \frac{2}{5} \end{pmatrix}$ and $c = \begin{pmatrix} \frac{1}{5} \\ \frac{4}{5} \end{pmatrix}$

Need Help? Read It | Talk to a Tutor

Show My Work (Optional)

---

3. -/1 pointsBerrFinMath1 8.2.003.

For the game and mixed strategies, find the expected value.

Let $G = \begin{pmatrix} 4 & 1 & 2 \\ -6 & 5 & -1 \end{pmatrix}$, $r = \begin{pmatrix} \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ and $c = \begin{pmatrix} \frac{1}{3} \\ \frac{1}{3} \\ \frac{1}{3} \end{pmatrix}$

Need Help? Read It | Talk to a Tutor

Show My Work (Optional)

---

4. -/1 pointsBerrFinMath1 8.2.004.

For the game and mixed strategies, find the expected value.

Let $G = \begin{pmatrix} 3 & 1 \\ -3 & 6 \\ -1 & 6 \end{pmatrix}$, $r = \begin{pmatrix} \frac{1}{2} & 0 & \frac{1}{2} \end{pmatrix}$ and $c = \begin{pmatrix} \frac{3}{5} \\ \frac{2}{5} \end{pmatrix}$

Need Help? Read It | Watch It | Talk to a Tutor

Show My Work (Optional)

5. -/6 pointsBerrFinMath1 8.2.005.

For the 2 × 2 game, find the optimal strategy for each player. Be sure to check for saddle points before using the formulas.

$$\begin{pmatrix} 2 & -4 \\ 1 & 2 \end{pmatrix}$$

For row player R:

$r_1 =$ ☐

$r_2 =$ ☐

For column player C:

$c_1 =$ ☐

$c_2 =$ ☐

Find the value v of the game for row player R.

$v =$ ☐

Who is the game favorable to?

- ○ The game is favorable to the row player.
- ○ The game is favorable to the column player.
- ○ This is a fair game.

Need Help? Read It | Watch It | Talk to a Tutor

Show My Work (Optional)

---

6. -/6 pointsBerrFinMath1 8.2.006.

For the 2 × 2 game, find the optimal strategy for each player. Be sure to check for saddle points before using the formulas.

$$\begin{pmatrix} 3 & 1 \\ -4 & 2 \end{pmatrix}$$

For row player R:

$r_1 =$ ☐

$r_2 =$ ☐

For column player C:

$c_1 =$ ☐

$c_2 =$ ☐

Find the value of the game for row player R.

$v =$ ☐

Who is the game favorable to?

- ◉ The game is favorable to the row player.
- ○ The game is favorable to the column player.
- ○ This is a fair game.

Need Help? Read It | Talk to a Tutor

Show My Work (Optional)

7. -/6 pointsBerrFinMath1 8.2.007.

For the 2 × 2 game, find the optimal strategy for each player. Be sure to check for saddle points before using the formulas.

$$\begin{pmatrix} 5 & -5 \\ -3 & 5 \end{pmatrix}$$

For row player R:

$r_1 =$ ☐

$r_2 =$ ☐

For column player C:

$c_1 =$ ☐

$c_2 =$ ☐

Find the value of the game for row player R.

$v =$ ☐

Who is the game favorable to?

- ○ This game is favorable to the row player.
- ○ This game is favorable to the column player.
- ◉ This is a fair game.

Need Help? Read It | Watch It | Talk to a Tutor

Show My Work (Optional)

---

8. -/11 pointsBerrFinMath1 8.2.008.

Represent the situation as a game and find the optimal strategy for each player. State your final answer in the terms of the original question.

Political scientists distinguish between two kinds of issues in elections campaigns: "positional" issues (voters have sharply divided and incompatible views) and "valence" issues (voters agree on goals but are divided on the best ways to achieve them). In a race between the incumbent and the challenger for state governor, a marketing survey found that if the incumbent focused on positional issues, she trailed the challenger by 20% if he focused on the same kind of issues, but she led him by 20% if he concentrated on valence issues. If she focused on valence issues, she trailed him by 25% if he focused on the same kind of issues, but she led him by 35% if he concentrated on positional issues.

Incumbent \ Challenger	P	V
P	☐ %	☐ %
V	☐ %	☐ %

What does P represent?

- ○ P represents positional issues.
- ○ P represents valence issues.

What does V represent?

- ○ V represents valence issues.
- ○ V represents positional issues.

For the incumbent:

$r_1 =$ ☐

$r_2 =$ ☐

For the challenger:

$c_1 =$ ☐

$c_2 =$ ☐

In designing the incumbent's TV ads for the campaign, what proportion should focus on positional issues?

☐ %

Need Help? Read It | Watch It | Talk to a Tutor

Show My Work (Optional)

9. -/15 pointsBerrFinMath1 8.2.010.

Represent the situation as a game and find the optimal strategy for each player. State your final answer in the terms of the original question.

In a section of Freshman Composition at your college, the English professor gives a daily quiz on either vocabulary or writing, and allows his students to bring either a dictionary or a grammar textbook (but not both) to use during the quiz. Joe estimates that if he brings a dictionary, he can get a 90 or a vocabulary quiz but only an 70 on a paragraph revision, while with his grammar textbook, he can get a 80 on the revision but only a 60 on the vocabulary quiz.

Quiz on

Joe brings		V	P
	D		
	G		

What does *D* represent?

- O *D* represents grammar textbook.
- O *D* represents vocabulary quiz.
- O *D* represents paragraph revision.
- O *D* represents dictionary.

What does *G* represent?

- O *G* represents grammar textbook.
- O *G* represents paragraph revision.
- O *G* represents dictionary.
- O *G* represents vocabulary quiz.

What does *V* represent?

- O *V* represents dictionary.
- O *V* represents grammar textbook.
- O *V* represents paragraph revision.
- ◉ *V* represents vocabulary quiz.

What does *P* represent?

- O *P* represents grammar textbook.
- ◉ *P* represents paragraph revision.
- O *P* represents dictionary.
- O *P* represents vocabulary quiz.

r_1 =
r_2 =
c_1 =
c_2 =
v =

How should he decide each day what to bring?

- O He should ask his friend which book to bring.
- O He should always take the dictionary.
- O He should always take the grammar textbook.
- O Flip a coin each day; take the dictionary if it is heads and the grammar textbook if it is tails.

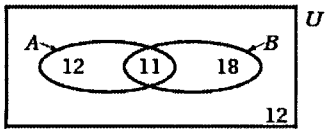
What grade can he be expected to earn?

Need Help? Read It Watch It Talk to a Tutor

Show My Work (Optional)

Find the number using the following Venn diagram.

$n(U)$

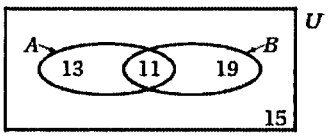


Show My Work (Optional)

/1 pointsBerrFinMath1 5.1.005.

Find the number using the following Venn diagram.

$n(A \cup B)$

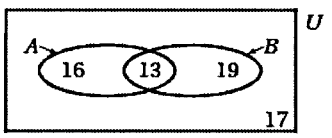


Show My Work (Optional)

/1 pointsBerrFinMath1 5.1.006.

Find the number using the following Venn diagram.

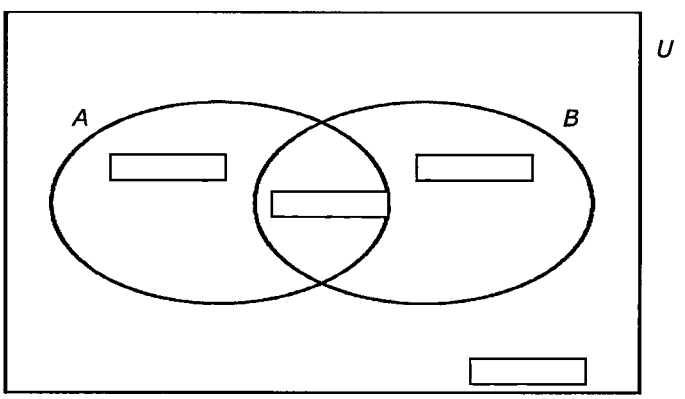
$n(A^C)$



Show My Work (Optional)

/4 pointsBerrFinMath1 5.1.011.

Given that $n(A) = 20$, $n(B) = 12$, $n(A \cap B) = 6$, and $n(U) = 40$, fill in the four regions in the Venn diagram.



Show My Work (Optional)

How many seven-symbol computer passwords can be formed using the letters A to J and the digits 4 to 7?

[ ] passwords

Show My Work (Optional)

---

6. -/1 pointsBerrFinMath1 5.2.002.

Calculate the quotient of factorials.

$$\frac{8!}{5!}$$

[ ]

Show My Work (Optional)

---

7. -/1 pointsBerrFinMath1 5.2.003.

Determine the number of permutations.

$${}_6P_2$$

[ ]

Show My Work (Optional)

---

8. -/1 pointsBerrFinMath1 5.2.005.

Find the number of combinations.

$${}_6C_3$$

[ ]

Show My Work (Optional)

---

9. -/2 pointsBerrFinMath1 5.2.008.

A computer password is to consist of five alphanumeric characters with no repeats. (An alphanumeric character is a letter from A to Z or a digit from 0 to 9.) How many such passwords are there?

[ ] passwords

How many are there if the letter O and the digit 0 are excluded to avoid confusion?

[ ] passwords

Show My Work (Optional)

---

10. -/1 pointsBerrFinMath1 5.2.010.

A junior high girls' basketball team is to consist of 5 players. How many different teams can the manager select from a roster of 9 girls?

[ ] teams

Show My Work (Optional)

---

11. -/2 pointsBerrFinMath1 5.3.004.

If a committee of 3 is to be chosen at random from a class of 12 students, what is the probability of any particular committee being selected? (Enter your answer as a fraction.)

[ ]

What if the committee is to consist of a president, a vice president, and a treasurer? (Enter your answer as a fraction.)

[ ]

Show My Work (Optional)

12.–/2 pointsBerrFinMath1 5.3.007.

A box contains 5 red and 8 green marbles. You reach in and remove 3 marbles all at once.

(a) Find the probability that these 3 marbles are all red. (Enter your answer as a fraction.)

(b) Find the probability that these 3 marbles are all of the same color. (Enter your answer as a fraction.)

Show My Work (Optional)

13.–/1 pointsBerrFinMath1 5.3.009.

The U.S. Senate consists of 100 members, 2 from each state. A committee of 6 senators is formed. What is the probability that it contains at least one senator from your state? (Round your answer to two decimal places.)

Show My Work (Optional)

14.–/1 pointsBerrFinMath1 5.3.010.

You carry six keys in your pocket, two of which are for the two locks on your front door. You lose one key. What is the probability that you can get into your house through the front door? (Enter your answer as a fraction.)

Show My Work (Optional)

15.–/1 pointsBerrFinMath1 5.4.006.

Suppose that 80% of drivers are "careful" and 20% are "reckless." Suppose further that a careful driver has a 0.2 probability of being in an accident in a given year, while for a reckless driver the probability is 0.4. What is the probability that a randomly selected driver will have an accident within a year? (Enter your answer to two decimal places.)

Show My Work (Optional)

16.–/2 pointsBerrFinMath1 5.4.001.

Use the given values to find the following. (Enter your answers as fractions.)

$P(A) = 0.7,\ P(B) = 0.3,\ P(A \cap B) = 0.1$

(a) $P(A \text{ given } B)$

(b) $P(B \text{ given } A)$

Show My Work (Optional)

17.–/1 pointsBerrFinMath1 5.4.003.

A box contains 3 white, 2 red, and 4 black marbles. One marble is chosen at random, and it is not black. Find the probability that it is white. (Enter your answer as a fraction.)

Show My Work (Optional)

18.–/1 pointsBerrFinMath1 5.4.005.

You will take either a basket-weaving course or a philosophy course, depending on what your advisor decides. You estimate that the probability of getting an A in basket weaving is 0.80, while in philosophy it is 0.70. However, the chances of your advisor choosing the basket-weaving course is only 20%, while there is an 80% chance that he will put you in the philosophy course. What is the probability that you end up with an A? (Enter your answer to three decimal places.)

Show My Work (Optional)

Two students are registered for the same class and attend independently of each other, student A 80% of the time and student B 70% of the time. The teacher remembers that on a given day at least one of them is in class. What is the probability that student A was in class that day? (Round your answer to three decimal places.)

[ ]

Show My Work (Optional)

20.–/6 pointsBerrFinMath1 8.1.001.

For the situation, identify the two players and their possible choices, and construct a payoff matrix for their conflict.

In an attempt to gain more viewers, Channel 86 and Channel 7 are each trying to decide whether to schedule a quiz show or a reality series in their 8:00 prime time slot. Market research indicates that if Channel 86 chooses a quiz show, it will gain 9% of the market if Channel 7 runs a quiz show and lose 10% if Channel 7 runs a reality series, while if Channel 86 chooses a reality series, it will gain 11% if Channel 7 runs a quiz show and lose 11% if Channel 7 runs a reality series. [*Hint:* Use Q and R for quiz show and reality series.]

		Channel 7	
		Q	*R*
Channel 86	*Q*	[ ] %	[ ] %
	R	[ ] %	[ ] %

What does *Q* represent?

- O Q represents a quiz show.
- O Q represents a reality show.

What does *R* represent?

- O R represents a quiz show.
- O R represents a reality show.

Show My Work (Optional)

21.–/5 pointsBerrFinMath1 8.1.003.

For the game, identify the saddle point and determine the corresponding optimal strategy for each player.

$$\begin{pmatrix} 6 & 9 \\ 2 & 7 \end{pmatrix}$$

The saddle point is the [ ] in row [ ] and column [ ].

The optimal strategy is for *R* to always choose row [ ] and for *C* to always choose column [ ].

Show My Work (Optional)

22.–/5 pointsBerrFinMath1 8.1.004.

For the game, identify the saddle point and determine the corresponding optimal strategy for each player.

$$\begin{pmatrix} 2 & -1 & 1 \\ 4 & -3 & -4 \end{pmatrix}$$

The saddle point is the [ ] in row [ ] and column [ ].

The optimal strategy is for *R* to always choose row [ ] and for *C* to always choose column [ ].

Show My Work (Optional)

Determine the optimal strategy for the situation by representing it as a game and finding the saddle point. State your final answer in the terms of the original question.

In an ongoing price war between Burger Haven (locally owned) and MacArches (a chain), both restaurant managers plan to change the price of a hamburger by 10¢. If they both raise their prices, there will be no change in their market shares, but if they both lower their prices, the chain's national advertising will ensure that MacArches gains 7% of the market. Again because of advertising, if Burger Haven lowers their price and MacArches raises their price, Burger Haven will gain only 4% of the market, but if Burger Haven raises their price and MacArches lowers their price, MacArches will gain 8% of the market. Use this information to decide what the managers should do.

		MacArches L	MacArches R
Burger Haven	L	____ %	____ %
	R	____ %	____ %

What does *L* represent?

- O *L* represents lowering the price by 10¢.
- O *L* represents raising the price by 10¢.

What does *R* represent?

- O *R* represents lowering the price by 10¢.
- O *R* represents raising the price by 10¢.

The saddle point is the [ ] in row [ ] and column [ ].

What should the managers do?

- O Burger Haven should lower its prices, while MacArches raises its prices.
- O Both restaurants should lower the price.
- ◉ Both restaurants should raise the price.
- O MacArches should lower its prices, while Burger Haven raises its prices.

Show My Work (Optional)

24.–/1 pointsBerrFinMath1 8.2.001.

For the game and mixed strategies, find the expected value.

Let $G = \begin{pmatrix} 4 & -7 \\ 5 & 2 \end{pmatrix}$, $r = \begin{pmatrix} \frac{1}{2} & \frac{1}{2} \end{pmatrix}$ and $c = \begin{pmatrix} \frac{1}{2} \\ \frac{1}{2} \end{pmatrix}$

[ ]

Show My Work (Optional)

For the 2 × 2 game, find the optimal strategy for each player. Be sure to check for saddle points before using the formulas.

$$\begin{pmatrix} 3 & -5 \\ 2 & 3 \end{pmatrix}$$

For row player R:

$r_1 =$ ☐

$r_2 =$ ☐

For column player C:

$c_1 =$ ☐

$c_2 =$ ☐

Find the value v of the game for row player R.

$v =$ ☐

Who is the game favorable to?

- ○ The game is favorable to the row player.
- ○ The game is favorable to the column player.
- ○ This is a fair game.

Show My Work (Optional)

26.–/12 pointsBerrFinMath1 8.2.009.

Represent the situation as a game and find the optimal strategy for each player. State your final answer in the terms of the original question.

A farmer grows apples on her 500-acre farm and must cope with occasional infestations of worms. If she refrains from using pesticides, she can get a premium for "organically grown" produce and her profits per acre increase by $900 if there is no infestation, but they decrease by $200 if there is. If she does use pesticides and there is an infestation, her crop is saved and the resulting apple shortage (since other farms are decimated) raises her profits by $700 per acre. Otherwise, her profits remain at their usual levels.

	No worms	Worms
No pesticides	☐	☐
Pesticides	☐	☐

$r_1 =$ ☐

$r_2 =$ ☐

$c_1 =$ ☐

$c_2 =$ ☐

$v =$ ☐

How should she divide her farm into a "pesticide-free" zone and a "pesticide-use" zone? (Round your answers to two decimal places.)

The farmer should set aside ☐ acres for pesticide-free apples and use pesticide on the other ☐ acres.

What will be her expected increase in profits per acre with this strategy?

This strategy will increase her expected profits by $ ☐ per acre.

Show My Work (Optional)