

6C Optimal Strategies for Games with No Stable Solution

Mixed strategy:

Expected pay-off:

1. A two-player zero-sum game is represented by the following pay-off matrix.

	B plays 1	B plays 2
A plays 1	4	-2
A plays 2	-5	3

Player A is considering three different mixed strategies:

Strategy X: play row 1 with probability 0.5 and row 2 with probability 0.5

Strategy Y: play row 1 with probability 0.6 and row 2 with probability 0.4

Strategy Z: play row 1 with probability 0.9 and row 2 with probability 0.1

Find the expected pay-offs for each mixed strategy.

	If B plays 1	If B plays 2
X		
Y		
Z		

Optimal mixed strategy for player A:

Value of a game with no stable solution:

To find the optimal mixed strategy for a player with two choices in a $2 \times n$ or $n \times 2$ game:

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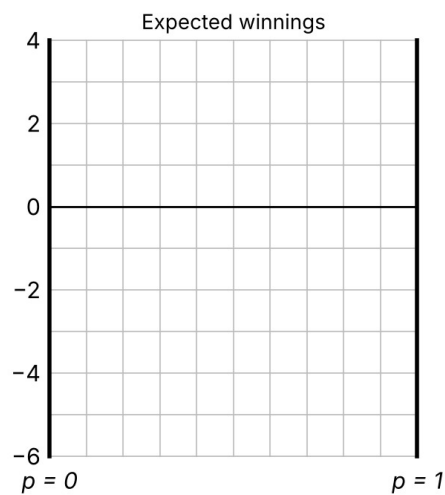
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2. A two-person zero-sum game is represented by the following pay-off matrix:

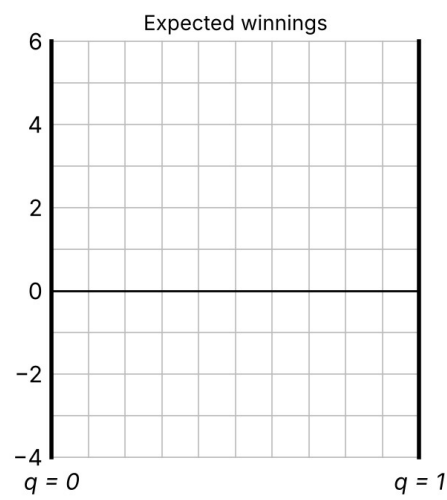
	B plays 1	B plays 2
A plays 1	4	-2
A plays 2	-5	3

Find the optimal mixed strategy a for player A, b for player B. In each case state the value of the game to that player.

a) For player A



b) For player B



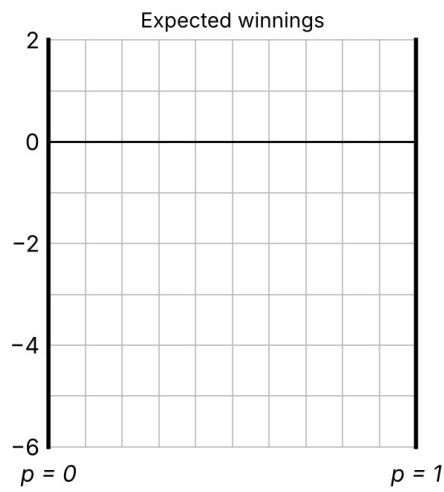
In a two-person zero-sum game, if the value of the game to player A is v , then the value of the game to player B will be

3. Alf and Bert play a zero-sum game, represented by the pay-off matrix below.

	Bert plays 1	Bert plays 2	Bert plays 3	Row minimum
Alf plays 1	-5	2	-1	
Alf plays 2	2	-3	1	
Column maximum				

a) Verify that this game has no stable solution.

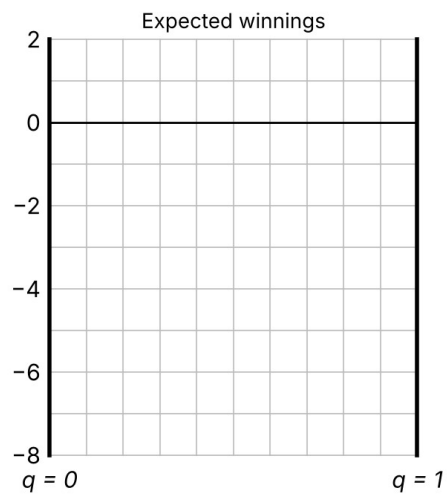
b) Determine Alf's best strategy and the value of the game to him.



If there is more than one intersection point, the best strategy is given by ...

4. A and B play a zero-sum game, given by the pay-off matrix below. Determine B's best strategy, and the value of the game to B.

	B plays 1	B plays 2	Row minimum
A plays 1	4	-1	
A plays 2	3	4	
A plays 3	1	7	
A plays 4	-2	8	
Column maximum			



Watch out: the optimal solution is not necessarily ...