

§14.1: TWO-PERSON CONSTANT-SUM GAMES: SADDLE POINTS

- 1.] Two companies A and B sell two brands of Nintendonitis medication. Company A advertises in radio (A_1) television (A_2), and newspapers (A_3). Company B , in addition to using radio (B_1), television (B_2), and newspapers (B_3), also mails brochures (B_4). Depending on the effectiveness of each advertising campaign, one company can capture a portion of the market from the other. The following reward matrix summarizes the percentage of the market captured or lost by company A . Determine the optimal strategy for each company and find the value of the game.

	B_1	B_2	B_3	B_4
A_1	8	-2	9	-3
A_2	6	5	6	8
A_3	-2	4	-9	5

- 2.] Find the value and the optimal strategy for the two-person zero-sum game given by the following reward matrix:

	B_1	B_2
A_1	2	2
A_2	1	3

- 3.] Find the value and the optimal strategy for the two-person zero-sum game given by the following reward matrix:

	B_1	B_2	B_3	B_4
A_1	4	5	5	8
A_2	6	7	6	9
A_3	5	7	5	4
A_4	6	6	5	5

- 4.] During the 8 to 9 PM time slot, two networks (A and B) are vying for an audience of 100 million viewers. The networks must simultaneously announce the type of show they will air in that time slot. The possible choices for each network and the number of network A viewers (in millions) for each choice are shown in the matrix below. This is a two-person constant-sum game. Does this game have a saddle point? What is the value of the game to network A and to network B ?

	Western	Soap Opera	Comedy
Western	35	15	60
Soap Opera	45	58	50
Comedy	28	14	70