Math 111 **Homework #3** **Fall 2018**

In problems 1 - 4,

(a) Use row and column dominance to reduce the payoff matrix as much as possible.

(b) If it can be reduced to a 1×1 game, then give the players' optimal pure strategies.

(c) If it can be reduced to a 1×1 game, then is it a fair game?

1.

	1	2	3
1	1	3	-1
2	2	-3	1
3	5	4	0

2.

	1	2	3
1	-2	1	-1
2	3	3	-1
3	5	1	4

3.

	1	2	3	4
1	2	3	0	0
2	1	2	-3	-2
3	1	-1	-2	-2
4	0	-1	-3	-1

4.

	1	2	3	4
1	3	4	4	5
2	6	-4	-2	-3
3	2	0	1	2
4	5	-8	-6	-4

5. In the Travelers' Dilemma, suppose that the airline will reimburse the travelers the value of their suitcases and contents up to a maximum of \$6, with a minimum reimbursement of \$2.

   (a) Draw the payoff matrix.

   (b) Use row and column dominance to reduce the payoff matrix to a 1×1 matrix.

   (c) What should the travelers do?

   (d) Generalize your conclusion to a situation where the airline will reimburse the travelers from \$2 up to \$1000.

6. In the Diners' Dilemma, suppose that there are three entrees on the menu. Andy and Bob each value the \$10 meal at \$10, the \$20 meal at \$16, and the \$30 meal at \$26.

   (a) Draw the payoff matrix.

   (b) Use row and column dominance to reduce the payoff matrix to a 1×1 matrix.

   (c) What should the diners do?

   (d) Generalize your conclusion to a situation where there are 10 entrees on the menu, valued at \$10, \$20, \$30, and so on up to \$100. Andy and Bob value each meal at \$4 less than the cost. (Thus, if each went to the restaurant alone, he would order the \$10 meal.)