Math 486. March 17, 2011 . Midterm 2. 5 problems, 15 points each. Name (here and on every page):

1-3. Solve the linear programs, where all $x_i >= 0$:

x_1	x_2	x_3	x_4	x_5	-1	Problem 1
10^{11}	2	0	0	6	-1	$= -x_6$
0	-1	2	0	3	-2	$= -x_7$
-1	0	0	4	-4	3	$= -x_8$
2	0	3^{-300}	0	1	2	$= f \to$ ~~min~~ max

Bad row.
LP is infeasible

2.
$x_1, x_2 >= 0$, $2x_1 + 3x_2 <= 6$, $3x_1 + 2x_2 \to \max$.

max = 9 at $x_1 = 3$, $x_2 = 0$

$x_1/3000$	$x_1/3000002$	$x_3/3000003$	$x_4/3000004$	$x_5/3000005$	-1	Problem 3
1/300001	-1/3000002	1/300003	1/300004	0	-2	$= -x_6$
-1/3000002	-1/3000002	-2/3003	0	0	1	$= -x_7$
1/3001	0	2/3003	-1/3000002	-4/3005	2	$= -x_8$
2/301	0	1/3000002	0	1/305	2	$= f \to \min$

4-5. Solve matrix games:

4.

	c1	c2	c3	c4	c5	c6	c7
R1	2	0	0	0	~~$3-10^{-100}$~~	~~5~~	~~10~~
R2	0	2	0	0	~~2~~	~~1~~	~~4~~
R3	0	0	2	0	~~2~~	~~0~~	~~$3-10^{-100}$~~
R4	0	0	0	2	~~2~~	~~$3-10^{-100}$~~	~~0~~
R5	~~0~~	~~0~~	~~0~~	~~-10^{-100}~~	~~0~~	~~0~~	~~$3-10^{-100}$~~

c1 dominates c5, c6, c7
R1 dominates R5
his optimal strategy:
[1/4, 1/4, 1/4, 1/4, 0]
her optimal strategy:
[1/4, 1/4, 1/4, 1/4, 0, 0, 0]
value of game = 1/2

5.

-10^{100}	$3-10^{-100}$	$3-10^{-100}$	$3-10^{-100}$	$3-10^{-100}$	$3-10^{-100}$	$3-10^{-100}$
0	2	0	-1	-2	-1	-1
0	3	3	0	-2	0	-1
-1	0	3	0	2	3	0
0	3	1	4	3	0	4

saddle point
value of game = 0