

## Answers to Problem Set 2: More Static Game Theory

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### 1. Nash Equilibrium

a) Chicken

	lose face	fight
lose face	6,6	2*,7*
fight	7*,2*	0,0

b) First Price Auction

Seagull = row player, VandeCamp = column player

	0	500	1000	10000	20000	25000
0	10000,500*	0,500*	0,0	0,-9000	0*,-19000	0*,-24000
500	19500*,0	9750,250*	0,0	0,-9000	0*,-19000	0*,-24000
1000	19000,0*	19000*,0*	9500,0*	0,-9000	0*,-19000	0*,-24000
10000	10000,0*	10000,0*	10000*,0*	5000*,-4500	0*,-19000	0*,-24000
20000	0,0*	0,0*	0,0*	0,0*	0*,-9500	0*,-24000
25000	-5000,0*	-5000,0*	-5000,0*	-5000,0*	-5000,0*	-2500,-12000

c) Dominance and Pareto Dominance

	1	0
1	$x, x$	$x-2, 2$
0	$2, x-2$	0,0

When  $x=1$  this is an ordinary Prisoner's Dilemma, so the unique dominant strategy equilibrium is 0,0.

When  $x=3$  the unique dominant strategy equilibrium is 3,3.

## 2. Duopoly

profits are

$$\pi_i = 1 + x_i - (x_i)^2 - ax_ix_{-i}$$

$$\frac{d\pi_i}{dx_i} = 1 - 2x_i - ax_{-i} = 0$$

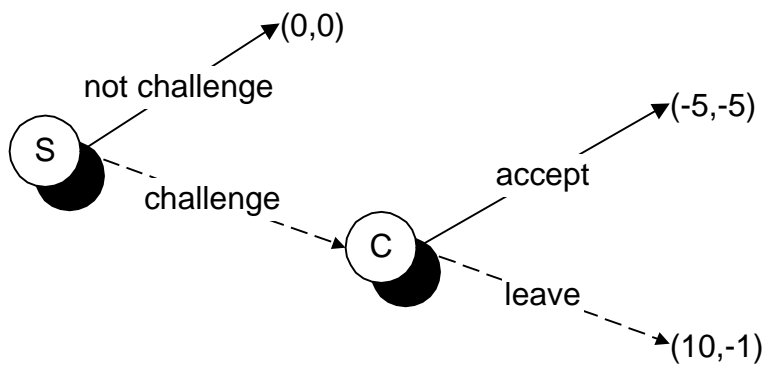
in the symmetric equilibrium  $x_i = x_{-i}$

$$x_i = \frac{1}{2+a}$$

As  $a$  increases the equilibrium level of film violence goes down.

## 3. The Challenge

extensive form with subgame perfect choices marked with dashed lines



normal form with best response correspondence and Nash equilibria marked

	accept	leave
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challenge	-5,-5	10*,-1*
not challenge	0*,0*	0,0