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

$$\pi_i = 1 + x_i - (x_i)^2 - ax_i x_{-i}$$
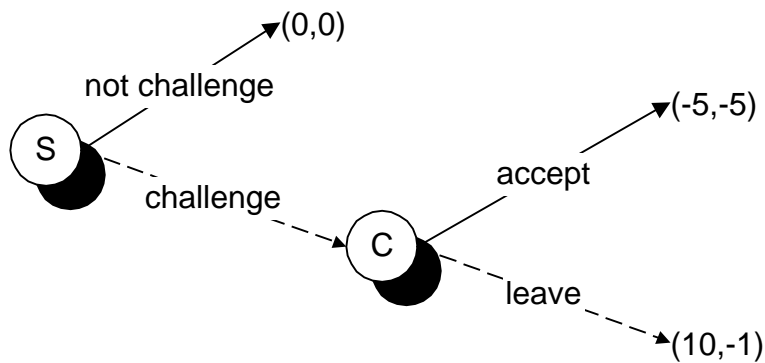$$\frac{d\pi_i}{dx_i} = 1 - 2x_i - ax_{-i} = 0$$

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