1. For the Hawk-Dove game we have:

Payoff Matrix	**H**	**D**
H	**(B/2) - C**	**B**
D	**0**	**B/2**

The problem lets B = 4, and C = 3. Therefore:

Payoff Matrix	**H**	**D**
H	**-1**	**4**
D	**0**	**2**

Clearly, the solution is mixed: each pure strategy, when rare, invades the other. Let p represent the frequency of H; the (1 - p) is the frequency of D. At the mixed ESS, H and D have equal expected payoffs:

$w(H) = -p + 4(1 - p) = 4 - 5p$
$w(D) = 0 + (1 - p)2 = 2 - 2p$

When p equilibrates at p^*: $2 - 2p^* = 4 - 5p^*$
Then $3p^* = 2$, so that $p^* = 2/3$.

2. Free entry: solitary joins group of G iff $w(G + 1) > w(1)$
   Solitary will join G = 2; will not join G = 3. $G\hat{} = 3$; $w(3) > w(1) > w(4)$.

Group control: Group of G evicts intruder if $w(G + 1) < w(G)$. $G^* = 2$.