1. **(a)** Since $(a,(d,f))$ and $(b,(d,f))$ are both backward-induction solutions, it must be that Player 1 is indifferent between z_2 and z_4. Since $(b,(d,e))$ is a backward-induction solution but $(a,(d,e))$ is not, it must be that Player 1 prefers z_3 to z_2. Thus there are only two inferences that we can make about Player 1's preferences: (1) $z_2 \sim_1 z_4$ and (2) $z_3 \succ_1 z_2$ (and thus, by transitivity, also $z_3 \succ_1 z_4$).

(a) Since both *e* and *f* are part of a backward-induction solution, it must be that Player 2 is indifferent between z_3 and z_4. Since *d* is part of a backward-induction solution but *c* is not, it must be that Player 2 prefers z_2 to z_1. Thus there are only two inferences that we can make about Player 2's preferences: (1) $z_3 \sim_2 z_4$ and (2) $z_2 \succ_2 z_1$.

(b) There are five possibilities, depending on where z_1 appears in the ranking: $\begin{pmatrix} best & z_1 \\ & z_3 \\ worst & z_2, z_4 \end{pmatrix}$,

$\begin{pmatrix} best & z_1, z_3 \\ worst & z_2, z_4 \end{pmatrix}$, $\begin{pmatrix} best & z_3 \\ & z_1 \\ worst & z_2, z_4 \end{pmatrix}$, $\begin{pmatrix} best & z_3 \\ worst & z_1, z_2, z_4 \end{pmatrix}$, $\begin{pmatrix} best & z_3 \\ & z_2, z_4 \\ worst & z_1 \end{pmatrix}$.

2. **(a) (and (b)** The strategic form is as follows. The Nash equilibria are highlighted.

Player 2, Player 1

	a c	a d	b c	b d
L e	2 , 5	2 , 5	3 , 3	3 , 3
L f	2 , 5	2 , 5	2 , 7	2 , 7
R e	3 , 2	1 , 1	3 , 2	1 , 1
R f	3 , 2	1 , 1	3 , 2	1 , 1

(Highlighted: (Le, ad), (Re, ac), (Re, bc), (Rf, ac), (Rf, bc).)

(c) There is a unique backward induction solution given by (Re, ac).

3. **(a)** For no values (if $b \le 2$ *H* weakly dominates *G*, however, *H* does not dominate *F*).

(b) (b.1) For $a < 3$. **(b.2)** The strictly dominant strategy is B.

(c) (c.1) For $a = 3$. **(c.2)** The weakly dominant strategy is B.

(d) • for any *a*, if $b > 2$ then (B,G) is the only pure-strategy Nash equilibrium.
• if $a > 3$ and $b < 2$ then (B,H) is the only pure-strategy Nash equilibrium.
• if $a \le 3$ and $b = 2$, then there are 3 pure-strategy Nash equilibria: (B,F), (B,G) and (B,H).

(e) • if $a \le 3$ and $b < 2$, then there are 2 pure-strategy Nash equilibria: (B,F) and (B,H)
• if $a \le 3$ and $b = 2$, then there are 2 pure-strategy Nash equilibria: (B,G) and (B,H).

To answer **(f)** and **(g)** first note that, for every pair of values of *a* and *b*, in the first round of elimination strategies A, D and E of Player 1 are among those that get eliminated.
If $b > 2$ then G cannot be deleted in the first round, while if $b \le 2$ G can be deleted in the first

round.
If $a > 3$ then C cannot be deleted in the first round, while if $a \leq 3$ C can be deleted in the first round. Thus:

- If $a > 3$ and $b > 2$ then in the first round delete A, D and E, in the second round delete F and H and in the third round delete C. Left with (B,G).
- If $a \leq 3$ and $b > 2$ then in the first round delete A, C, D and E and in the second round delete F and H. Left with (B,G).
- If $a \leq 3$ and $b \leq 2$ then in the first round delete A, C, D, E and G and no more deletions are possible. Left with (B,F) and (B,H).
- If $a > 3$ and $b \leq 2$ then in the first round delete A, D, E and G, in the second round delete F and in the third round delete C. Left with (B,H).

Hence:

(f) For $a \leq 3$ and $b \leq 2$.

(g) For $a > 3$ and any value of b, or for $a \leq 3$ and $b > 2$.

4. (c,k), (c,m), (d,k), (d,m)