ECON 439
Quiz 4
Dr. Kevin Hasker

1. *(2+2=4 points)* Please read and sign the following statement:

   I promise that my answers to this test are based on my own work without reference to any notes, books, or the assistance of any other person during the test. I will also not use a calculator or other electronic aid for calculation during this test.

   Name and Surname: _
   Student ID: _
   Signature:

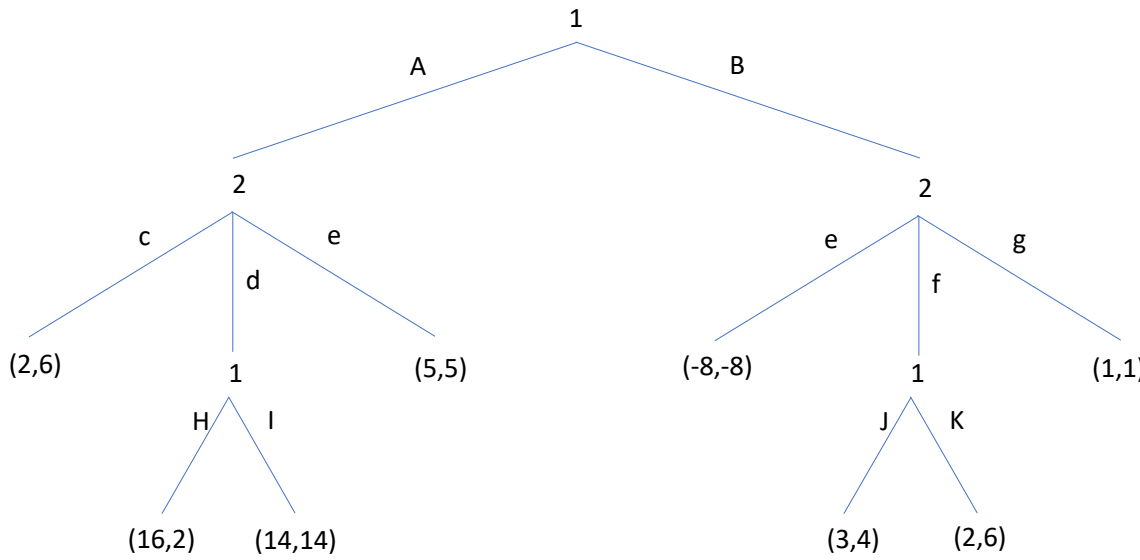
   _

   Remark 1 *First of all, due to the graph being too wide it did not print. Thus I told them to* ***ignore action g****.*

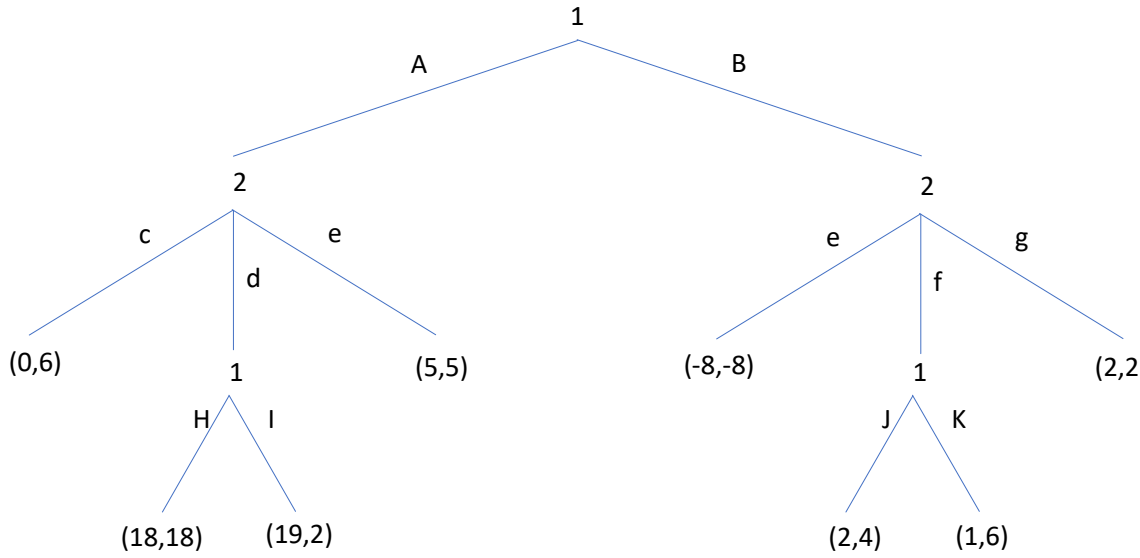
   Second of all, I inadvertantly used e twice. I told them to write them e (A) and e (B) but don't mark them down unless real confusion is possible.

   Finally, due to deleting the action g sometimes there was no empty threat NE, so that question is worth nothing now. Instead this has been folded into the adjustment.

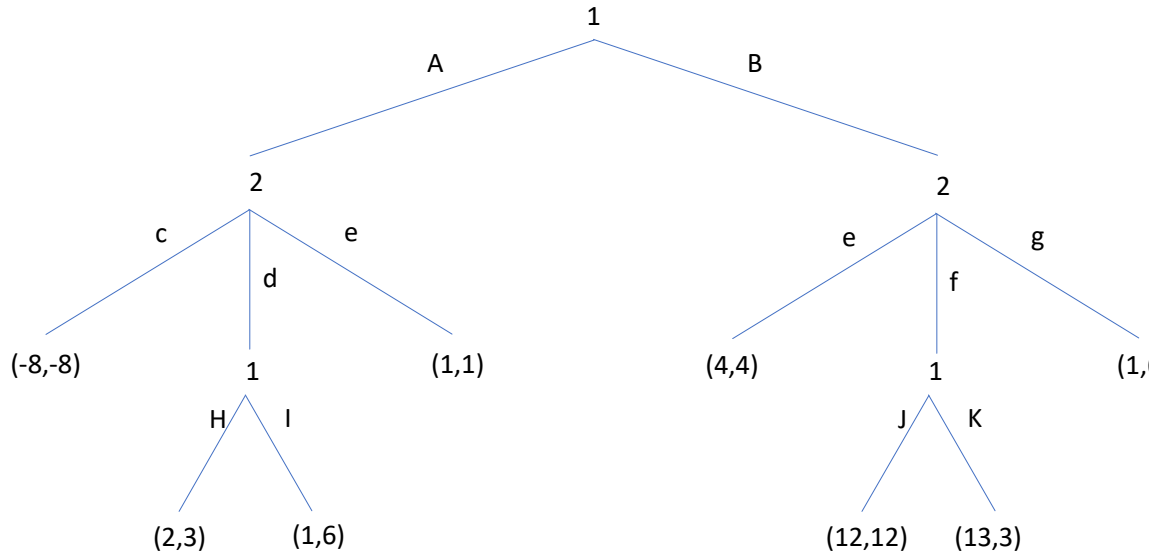
2. *(18 points total)* Consider the following sequential game, where player 1 makes the first decision, choosing between A and B.



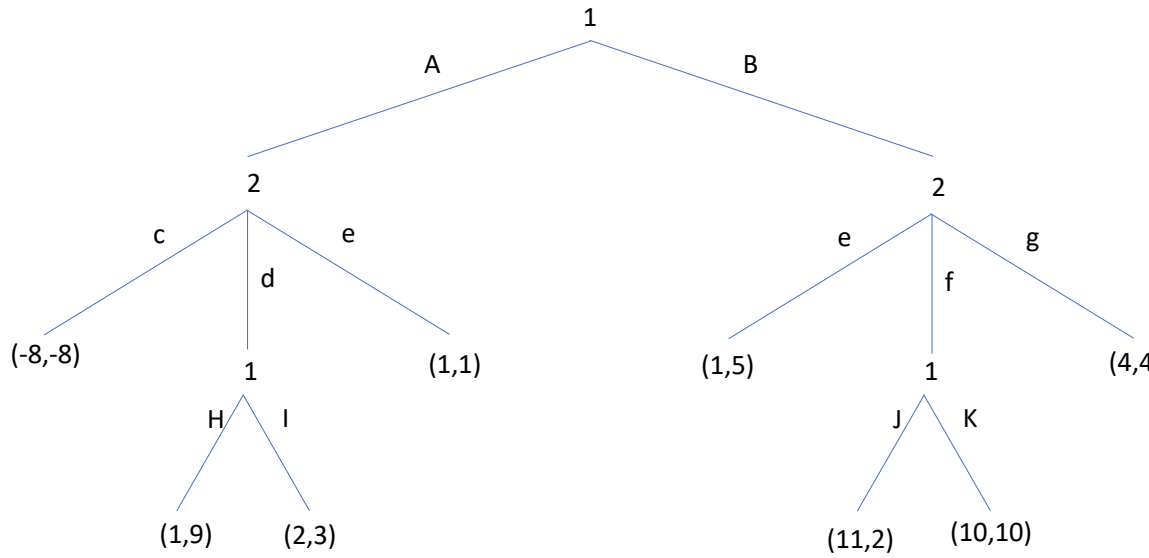
$(B, H, J)\,(c, f)$



$(B, I, J)\,(c, f)$



$(B, H, K)\,(d, e\,(B))$



$(A, I, J)\,(e(A), e(B))$

(a) *(9 points)* Write down all the strategies of both players.

$$\begin{aligned} S_1 &= \{A, B\} \times \{H, I\} \times \{J, K\} \\ &= \left\{ \begin{array}{l} (A, H, J), (A, H, K), (A, I, J), (A, I, K), \\ (B, H, J), (B, H, K), (B, I, J), (B, I, K) \end{array} \right\} \\ S_2 &= \{c, d, e(A)\} \times \{e(B), f\} \\ &= \{(c, e(B)), (c, f), (d, e(B)), (d, f), (e(A), e(B)), (e(A), f), \} \end{aligned}$$

Remark 2 *Roughly a half point per strategy, perhaps a point for the first strategy for each player. Then at the end of the day you might want to give a "correct answer bonus"*
Oh, and round up like always.

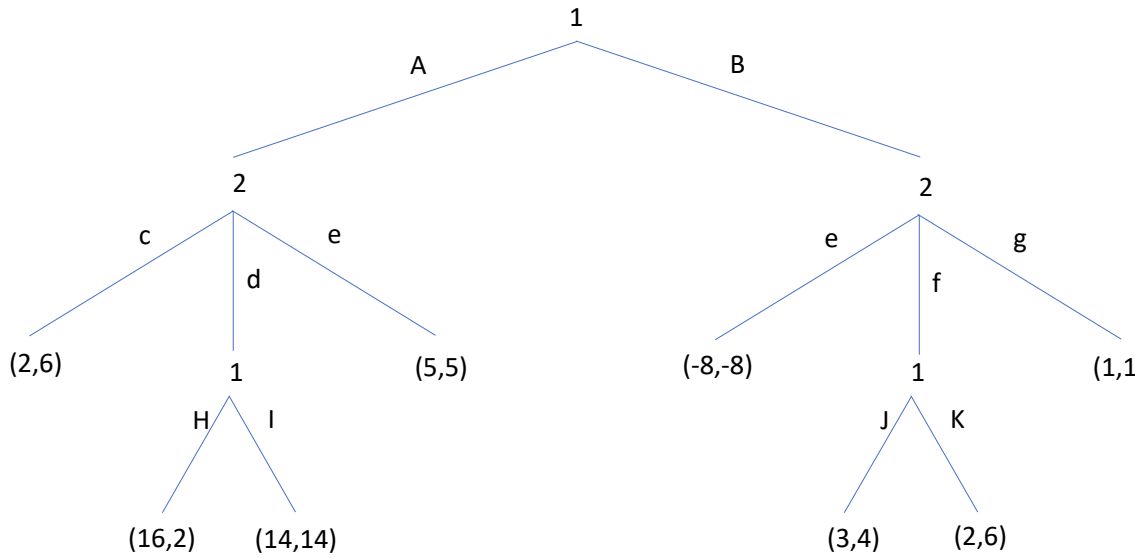
(b) *(7 points)* Find the subgame perfect equilibrium strategies using backward induction, and write them down below.

Solution 3 *Below each game above given that g was deleted I have written the equilibrium strategies. One can deduce the BR's from this.*
They must write the strategies here, if they do not or get some answers wrong you can look at their game for partial credit. As long as their marks are clear you can give them a point for each BR, ***but the final 2 points is for writing out the strategy correctly in this space.***

(c) *(2-2=0 points)* There is a fairly obvious empty threat Nash equilibrium in this game, if you can find it write down the strategies below.

Remark 4 *This question was deleted since in one version without g no answer was possible.*

For the fun of it let me give the answer for the game:



In equilibrium P1 chooses B, it is fairly obvious that if 2 chooses $e(B)$ then P1 will choose A. The critical part of the strategies will then be $(c, e(b))$ (A), this is enough to describe this Nash equilibrium, though one could also write $(c, e(b))$ (A, H, J)