Exercises 2

1. A child can either eat his/her porridge or not to eat it. A mother can either punish the child or not punish the child. The child hates porridge but hates the punishment even more. A mother would like the child to eat the porridge but finds it painful to punish her child. Depict the situation as an extensive form game. Determine its equilibria. Are some more plausible than some others? Construct the corresponding normal form game, and find equilibria in that.

2. Consider a market for diamonds where the quality of a diamond is uniformly distributed on $[10, 20]$. If a quality of a diamond is q a seller values it at q and a buyer values it at $q + \varepsilon$ where $\varepsilon \in (0, 1)$. Assume that diamonds are sold at the diamond mine where neither the seller nor the buyer can ascertain their quality.

i) Show that there is a price such that buyers and sellers are willing to trade the diamonds at this price.

ii) Assume next that the sellers know the quality, and determine whether there exists any price at which any diamonds are traded.

3. Consider exactly the above situation except that now the buyers' valuation is given by αq where $\alpha \in (1, 2)$.

4. Two players negotiate about a division of a cake by making offers in alternate turns. If an offer is accepted the cake is divided according to the offer. Otherwise the player who rejected the offer makes a new one. Making an offer and responding to it takes one period. There are altogether two periods after which the cake vanishes if no offer has been accepted. Player 1 has discount factor $0 < \delta < 1$ while player 2 has either of the discount factors δ or ρ with equal probabilities, $\rho > \delta$. Player 2's discount factor is private information while player 1's discount factor is common knowledge. Determine a 'reasonable' equilibrium of the game.

5. There are three players A, B and C. Player A moves first and can choose either $left$ or $right$. Then B moves and can choose up,$middle$ or $down$. Finally, C chooses either $heads$ or $tails$. Write down the players' strategy sets.