1. Gintis, problem 4.25. Player 1 has three strategies (pick 1, pick 2, pick 3). Player 2 has five strategies:

   (1) Guess 1. If told it is low, guess 2.
   (2) Guess 1. If told it is low, guess 3.
   (3) Guess 2. If told it is high, guess 1. If told it is low, guess 3.
   (4) Guess 3. If told it is high, guess 1.
   (5) Guess 3. If told it is high, guess 2.

(a) For part (a), just do the following.

   i. Construct the payoff matrix, and check your work on p. 420.
   ii. Show that there are no pure strategy Nash equilibria.
   iii. To look for mixed strategy Nash equilibria, let $\sigma_1 = (p_1, p_2, p_3)$ be a mixed strategy for player 1, and let $\sigma_2 = (q_1, q_2, q_3, q_4, q_5)$ be a mixed strategy for player 2. Find a Nash equilibrium in which all player 1’s strategies are active, and only player 2’s second, third, and fourth strategies are active.
   iv. Determine whether there is a Nash equilibrium in which all player 1’s strategies are active, and only player 2’s first, third, and fifth strategies are active.

(b) For part (b), find the expected payoff to player 2 from the mixed strategy Nash equilibrium you found in part (a)(iii).