Name: _____

MAT 364/564   **Quiz 1**   Fall 2020

1. The game of Nim is played with one stack of four counters and two stacks of three counters each. What qualifies as a winning move for the first player?

   a) take one counter   b) take four counters   c) take two counters   d) take three counters   e) no move

   Correct Answer: take four counters

2. The game of domineering is played on two adjacent (but not connected) two by two boards, of four squares each. True or False:

   i) First player has a winnning strategy

   ii) Each player will be restricted to one of the two boards

   iii) The game will last for four moves

   a) FTF   b) TFT   c) FTT   d) FFF   e) TTT

   Correct Answer: FTT

3. The game Chomp is played on a ten by ten rectangular board, with an x in the bottom left corner. In class we proved, using the Fundamental Theorem of two player combinatorial games, that: (True or False)

   i) It is a winning move for first player to chomp the top right square

   ii) Second player has a winning strategy by symmetry

   iii) A winning strategy for first player cannot be constructed

   a) FTF   b) TFT   c) FTT   d) FFF   e) TTT

   Correct Answer: FFF

4. Suppose the game of Amazons is played on a two by two board, with only one piece of each Black (Left) and White (Right). How many moves will the game last?

   a) 1   b) 3   c) 5   d) 2   e) 4

   Correct Answer: 2

5. Suppose a game is played with two stacks of ten counters each. Each player moves by splitting one stack into two nonempty stacks (of at least one counter each). If a player cannot move, they lose. Assume the players are called First and Second, and as usual that "First Wins" translates as "First has a winning strategy", etc. Which of the following are true:

   i)   First Wins   ii) Second Wins   iii) The game could end in a draw

   a) i) only   b) iii) only   c) i) and iii) only   d) ii) only   e) none of these

   Correct Answer: ii) only