

Math 30 Introduction to Problem Solving
Some problems for 2/23

2/23.1) Prove that there are no integer solutions to

$$15x^2 - 7y^2 = 9.$$

2/23.2) Consider a circular row of n seats each with a child. The children can rearrange themselves but they can move at most one seat. Let a_n be the number of ways. Determine a_n .

2/23.3) Every point in the plane is colored one of three colors: Red, Blue, Yellow. Prove there exists a line segment of length one which has endpoints the same color.

2/23.4) In each square of an 8×8 chessboard there is an integer. You can make the following moves: (a) Choose a 4×4 square and add one to each integer in the chosen square and (b) choose a 3×3 square and add one to each integer in the chosen square. Can you always get a table with every integer divisible by 2?