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Ryan Mullen* (mullenr@sacredheart.edu), 32 Thomas Dr, Manchester, CT 06040. *On determining Paint by Numbers puzzles with non unique solutions.* Preliminary report.

Paint by Numbers is a classic logic puzzle in which the squares of an $n \times m$ grid are to be colored in such a way to display a picture. The decision on which squares to color is determined by sequences of numbers to the left of each row and above each column. The numbers describe how many consecutive squares are to be colored in that row or column, multiple numbers represent multiple blocks of colored in squares (with at least one uncolored square in between blocks.) Certain natural questions arise. For a given $n \times m$ grid how many possible sequences are in a single column or row? For a given grid how many puzzles are there? How many of these have unique solutions? We will explore these questions as well as connections between Paint by Numbers puzzles, partition theory, and the Fibonacci sequence. (Received September 05, 2008)