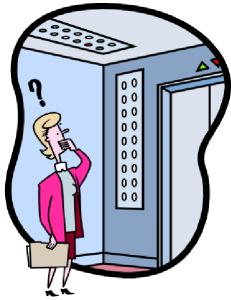


UW Math Circle
September 29th, 2016

1. How many ways are there to color the squares of a 2×2 grid, if each square must be colored either red or blue?
2. An office building has 30 floors and one broken elevator. When you press the “up” button on the elevator, it goes up 13 floors. If you press the “down” button, it goes down 8 floors. If you’re on the 8th floor, is it possible to get to the 13th floor? (The elevator does not move if there are not enough floors to go up or down.)



3. Austin tore out a section of successive pages from a book. The first page he tore out was numbered 165, and the last page he tore out was also numbered with the digits 1, 6, and 5 in some order. How many pages did Austin tear out of the book?
4. How many 5 digit numbers are there with only odd digits? How many 5 digit numbers are there with exactly one odd digit?
5. The University of Washington is holding a talent competition. The competition has five contests: math, physics, chemistry, biology, and ballroom dancing. Any student can enter into any number of the contests but only once for each one. It turned out that each student participated in an odd number of contests and each contest had an odd number of participants. Was the total number of contestants odd or even?