

Math 55 Discussion problems 9 Mar

1. How many positive integers less than 1,000,000 have exactly one digit equal to 9 and have a sum of digits equal to 13?
2. How many strings with seven or more characters can be formed from the letters in EVERGREEN?
3. A professor packs her collection of 40 issues of a mathematics journal in four boxes with 10 issues per box. How many ways can she distribute the journals if
 - (a) each box is numbered, so that they are distinguishable?
 - (b) the boxes are identical, so that they cannot be distinguished?
4. How many ways are there to distribute five balls into seven boxes if each box must have at most one ball in it if
 - (a) both the balls and boxes are labeled?
 - (b) the balls are labeled, but the boxes are unlabeled?
 - (c) the balls are unlabeled, but the boxes are labeled?
 - (d) both the balls and boxes are unlabeled?
5. Show that if five points are picked in the interior of a square with a side length of 2, then at least two of these points are no farther than $\sqrt{2}$ apart.
6. How many ways are there to choose a dozen apples from a bushel containing 20 indistinguishable Delicious apples, 20 indistinguishable Macintosh apples, and 20 indistinguishable Granny Smith apples, if at least three of each kind must be chosen?