

MAT 116 In-class Problems (#3)

June 28, 2010 and June 29, 2010

1. Consider the multiset $S = \{2 \cdot a, 1 \cdot b, 3 \cdot c\}$ of six objects of three types.

- (a) Find the number of permutations of S .
- (b) Find the number of 5-permutations of S .
- (c) Find the number of 4-permutations of S .

2. What is the number of integral solutions of the equation

$$x_1 + x_2 + x_3 + x_4 = 20$$

subject to the conditions $x_1 \geq 0$, $x_2 \geq 1$, $x_3 \geq 3$ and $x_4 \geq 5$?

3. How many ways are there to fill a box of a dozen doughnuts chosen from four varieties?

4. How many ways are there to fill a box of a dozen doughnuts chosen from four varieties with the requirement that each variety is represented in the box of doughnuts?

5. There are 10 identical sticks lined up in a row occupying 10 distinct places as follows:

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Four of them are chosen. How many choices are there if no two of the chosen sticks can be consecutive?