

Math 3338 Homework Solutions

Total 26

1. 12 new employees, 8 male, 4 female

③ a. # ways to choose committee of 5 =  $\binom{12}{5} = \frac{12!}{7!5!} = 792$

③ b. # of these all male =  $\binom{8}{5} = \frac{8!}{3!5!} = 8 \cdot 7 = 56$

2. Ten employees to be divided into 3 jobs assignments

5 in Job 1, 3 to Job 2, 2 to Job 3

How many ways to assign these jobs?

③ Solution  $\frac{10!}{5!3!2!} = 2,520$

3. 7 applicants for 2 jobs. How many ways to fill if:

a. First person hired receives more salary.

③ Solution Order matters, count # permutations  $7P_2 = \frac{7!}{5!} = 42$

Alternate: if jobs are different and the higher paid employee can be assigned to either job, then there are  $2 \times 42 = 84$  jobs.

③ b. The two jobs have the same pay + work requirements

Solution Order does not matter  $\binom{7}{2} = \frac{7!}{2!5!} = \underline{21}$

4. 6 different tulips + 5 different roses to put in a row

③ a.  $6!5!$  ways to order = 34,560,000

⑤ b. All tulips must be together  $\rightarrow$  1<sup>st</sup> tulip in position 1, 2, 3, 4, 5, 6

5! ways to arrange 5 roses 6! ways to arrange 6 tulips

get  $6! \cdot 5! \cdot 6$  arrangements =  $720 \cdot 120 \cdot 6 = (6!)^2 = 518,400$

③ 5. # distinguishable ways to rearrange "employee" 8 letters, 3 e's, 5 other

=  $\frac{8!}{3!} = 6,720$