

Supplemental WS #11

① 4 groups: adventure, arcade, puzzle, simulation

$$\begin{array}{l} \text{# groups} \\ \text{size of each group} \end{array} \quad \frac{4!}{4!} \frac{4!}{4!} \frac{4!}{4!} \frac{2!}{2!} \frac{5!}{5!} = 3 \cdot 3 \cdot 7 \cdot 760$$

② 4 groups: VVV, C, C, C

Permutations of 4 groups: $4! = 24$

Since 2 of the vowels are the same, the number of permutations of the vowels

is: $\frac{3!}{2!} = 3$

$$\begin{array}{l} \text{# groups} \\ \text{vowels} \end{array} \quad \frac{24}{3} \frac{1!}{1!} \frac{1!}{1!} \frac{1!}{1!} = 72$$

③ a) 4 groups: BE, A, C, D

$$\text{# groups} \quad 4! \cdot 2! = 48$$

b) Total - CE together = CE not together

$$5! - 4! \cdot 2! = 120 - 48 = 72$$

④ a) 4 couples = 4 groups
 2 people per group

$$\therefore 4! \cdot 2! \cdot 2! \cdot 2! \cdot 2! = 384$$

b) Case 1 $\frac{4}{m} \frac{4}{w} \frac{3}{m} \frac{3}{w} \frac{2}{m} \frac{2}{w} \frac{1}{m} \frac{1}{w} = 4! \cdot 4!$

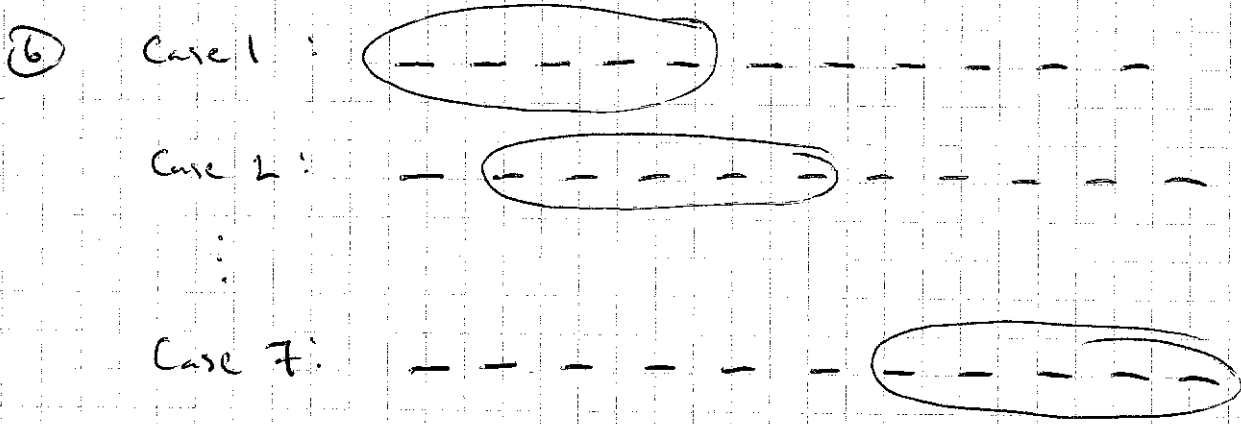
Case 2 $\frac{4}{w} \frac{4}{m} \frac{3}{w} \frac{3}{m} \frac{2}{w} \frac{2}{m} \frac{1}{w} \frac{1}{m} = 4! \cdot 4!$

1152

⑤ Case 1: $\frac{3}{B} \frac{3}{S} \frac{2}{B} \frac{2}{S} \frac{1}{B} \frac{1}{S} = 3! \cdot 3! = 36$

Case 2: $\frac{3}{S} \frac{3}{B} \frac{2}{S} \frac{2}{B} \frac{1}{S} \frac{1}{B} = 3! \cdot 3! = 36$

72



7 ways to sit the group, 5 in group

$$\therefore 7 \cdot 5! = 840$$

⑦ Case 1:

$$\frac{1}{5} \quad \frac{1}{3} \quad \frac{2}{7 \text{ or } 8} \quad \frac{3}{3} = 6$$

Case 2:

$$\frac{1}{5} \quad \frac{2}{7 \text{ or } 8} \quad \frac{4}{4} \quad \frac{3}{3} = 24$$

Case 3:

$$\frac{2}{7 \text{ or } 8} \quad \frac{5}{5} \quad \frac{4}{4} \quad \frac{3}{3} = 120$$

150