

**COMBINATORICS WS** **B**

1) Determine how many different license plates are possible for each situation.

A. 2 letters followed by 5 digits and both can be repeated.

$$\underline{26} \cdot \underline{26} \cdot \underline{10} \cdot \underline{10} \cdot \underline{10} \cdot \underline{10} \cdot \underline{10} = 67600000$$

B. 5 digits followed by 3 letters and neither can be repeated.

$$\underline{10} \cdot \underline{9} \cdot \underline{8} \cdot \underline{7} \cdot \underline{6} \cdot \underline{26} \cdot \underline{25} \cdot \underline{24} = 471744000$$

Find the number of distinguishable arrangements of the letters in each word.

2) YELLOW  $\frac{6!}{2!} = 360$

3) PANAMA  $\frac{6!}{3!} = 4320$

4) FACTORIAL  $\frac{9!}{2!} = 181,440$

5) HONOLULU  $\frac{8!}{2! \cdot 2! \cdot 2!} = 5040$

6) MISSISSIPPI  $\frac{11!}{4! \cdot 4! \cdot 2!} = 34,650$

7) ARKANSAS  $\frac{8!}{3! \cdot 2!} = 3360$

4S  
4I  
2P

8) You want to purchase a class ring. The ring can be made from 3 different metals. You can choose from 6 different side designs and 12 different stones. How many different class rings are possible if you have to pick one metal, one side design and one stone?

$$3 \cdot 6 \cdot 12 = 216$$

9) A photographer lines up the 15 members of a family in a single line in order to take a photograph. How many different ways can the photographer arrange the family members for the picture?

$$15! = 1.3 \times 10^{12}$$

10) A Spanish Club is electing a president, vice president, and a secretary. The club has 9 members who are eligible for these offices. How many different ways can the 3 offices be filled?

$$\frac{9}{P} \cdot \frac{8}{V} \cdot \frac{7}{S} = 504$$