

**6 PROBABILITY**  
Check Up #1  
→ 2/19/2013

1. What is the value of  ${}_{7}P_4$ ?

$$\frac{7!}{(7-4)!} = \frac{7!}{3!} = \frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1}}{3 \cdot 2 \cdot 1} = \boxed{840}$$

2. What is the value of  $\binom{7}{3}$ ?

$$\frac{7!}{3!4!} = \frac{7 \cdot 6 \cdot 5 \cdot 4 \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1}}{3 \cdot 2 \cdot 1 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = \boxed{35}$$

3. "Order Matters" in Permutations or Combinations?

4. How many 6-letter permutations can you make from the word "COCOON"? *Set Up*

$$\frac{6!}{3!2!}$$


5. A three-person committee is chosen at random from a group of 6 people. How many different committees are possible?

$${}_{6}C_3 = \frac{6!}{3!(6-3)!} = \frac{6 \cdot 5 \cdot 4 \cdot \cancel{3} \cdot \cancel{2} \cdot \cancel{1}}{3 \cdot 2 \cdot 1 \cdot 3 \cdot 2 \cdot 1} = \boxed{20}$$

~~order?~~

6. If there are 20 boys in class and 30 girls, then what is the probability of the teacher randomly chooses a boy to answer a question?

$$\frac{20}{50} = \boxed{\frac{2}{5}}$$



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1. What

$$\frac{7 \cdot 6 \cdot 5 \cdot 4}{42 \cdot 20} = \frac{840}{840}$$


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7. Mrs Potato Head goes shopping and now has 4 hats, 6 shoes, and 5 handbags. How many different outfits does she have?

$$4 \cdot 6 \cdot 5 = \boxed{120}$$

→ 8. Marcus wants to create a 6-character screen name. He wants to use arrangements of the 6 letters of his first name for the first 3 characters followed by 3 digits from the number 2013. How many different screen names can be created in this way? (Repetition of letters and digits is allowed)

$$\begin{array}{c} \text{set up:} \\ \underline{6 \cdot 6 \cdot 6} / \underline{4 \cdot 4 \cdot 4} \end{array}$$

→ 9. Kyle wants to create a 7-character password. The first 4 letters must be a letter from his first name, and the last 3 characters must be a digit from the number 685. How many different passwords are possible? (Repetition is **NOT** allowed.)

$$\frac{4 \cdot 3 \cdot 2 \cdot 1}{24} / \frac{3 \cdot 2 \cdot 1}{6} = \boxed{144}$$

10. You are allowed to choose 5 kitties to take home from a bunch of 9. How many different groups of kitties could you take home?

$${}^9C_5 = \frac{9!}{5!(9-5)!} = \frac{9!}{5!4!}$$

$$\frac{9 \cdot 8 \cdot 7 \cdot 6 \cdot 5 \cdot 4 \cdot 3 \cdot 2 \cdot 1}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = \boxed{126}$$

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