Probability and Statistics

Probability

Permutations and Combinations

Example 1

1. Jamie purchased 3 blouses, 3 jackets, and 2 skirts. How many different outfits using a blouse, a jacket, and a skirt are possible?

2. An Internet code consists of one digit followed by one letter. The number zero and the letter *O* are excluded. How many codes are possible?

Example 2

3. Nate is on a 7-day vacation. He plans to spend one day jet skiing and one day golfing. How many ways can Nate schedule the 2 activities?

4. How many ways can you listen to 3 songs from a CD that has 12 selections?

5. Members from 6 different school organizations decorated floats for the homecoming parade. How many different ways can first, second, and third prize be awarded?

Example 3

6. A teacher wants to send 4 students to the library each day. There are 21 students in the class. How many ways can he choose 4 students to go to the library on the first day?

7. Gregory has a coupon for $1 off the purchase of 3 boxes of Munchie brand cereal. The store has 5 different varieties of Munchie brand cereal. How many ways can Gregory choose 3 boxes of cereal so that each box is a different variety?

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1. blouse jacket skirt

$3 \times 3 \times 2 = 18$

There are 18 different outfits.

2. digit letter

$9 \times 25 = 225$

There are 225 different codes.

3. ${}_7P_2 = \frac{7!}{(7-2)!} = \frac{7!}{5!}$

$= 7 \cdot 6 = 42$

There are 42 ways to schedule the 2 activities.

4. ${}_{12}P_3 = \frac{12!}{(12-3)!} = \frac{12!}{9!}$

$= 12 \cdot 11 \cdot 10 = 1320$

There are 1320 ways to listen to 3 songs.

5. ${}_6P_3 = \frac{6!}{(6-3)!} = \frac{6!}{3!}$

$= 6 \cdot 5 \cdot 4 = 120$

There are 120 ways the prizes can be awarded.

6. ${}_{21}C_4 = \frac{21!}{4!(21-4)!} = \frac{21!}{4!17!}$

$= \frac{21 \cdot 20 \cdot 19 \cdot 18}{4 \cdot 3 \cdot 2 \cdot 1} = 5985$

There are 5985 ways to send 4 students to the library.

7. ${}_5C_3 = \frac{5!}{3!(5-3)!} = \frac{5!}{3!2!}$

$= \frac{5 \cdot 4}{2 \cdot 1} = 10$

There are 10 ways to choose 3 boxes of cereal.