

1. Compute the following:

$$(a) C(30, 3) = \frac{30 \cdot 29 \cdot 28}{3 \cdot 2 \cdot 1} = 4060$$

$$(b) C(15, 4) = \frac{15 \cdot 14 \cdot 13 \cdot 12}{4 \cdot 3 \cdot 2 \cdot 1} = 1365$$

$$(c) C(9, 5) = \frac{9 \cdot 8 \cdot 7 \cdot 6 \cdot 5}{5 \cdot 4 \cdot 3 \cdot 2 \cdot 1} = 126$$

$$(d) C(25, 2) = \frac{25 \cdot 24}{2 \cdot 1} = 300$$

2. How many committees of 3 people can be formed from a group of 8 people? $C(8, 3)$

3. A sample of 3 light bulbs is randomly selected from a batch of 15. How many different samples are possible?
 $C(15, 3)$

4. A major department store chain will be closing 4 of its 11 stores in the state. In how many ways can the 4 stores be chosen? $C(11, 4)$

5. How many tennis doubles teams can be formed from 12 players? $C(12, 2)$

6. In how many ways can a host choose 4 couples to invite for dinner from a group of 10 couples? $C(10, 4)$

7. 3 people are randomly chosen out of 50 people to receive a door prize. If the door prizes are identical, in how many ways may they be given out? $C(50, 3)$

8. A standard deck of 52 cards has 4 suits (Diamonds, Hearts, Clubs and Spades) and there are 13 cards in each suit (Ace through King).

(a) In how many ways can 4 Diamonds be chosen from the deck? $C(13, 4)$

(b) In how many ways can a hand of 4 red cards be chosen from the deck? $C(26, 4)$

(c) In how many ways can 2 kings and 2 queens be chosen? $C(4, 2) \cdot C(4, 2)$

9. A city council is composed of 5 liberals and 4 conservatives. A delegation of 3 is to be selected to attend a convention.

(a) How many delegations are possible? $C(9, 3)$

(b) How many of these delegations could have all liberals? $C(5, 3)$

(c) How many of these delegations can have 2 conservatives and 1 liberals? $C(4, 2) \cdot C(5, 1)$

(d) How many of these delegations could have 2 or more liberals? $C(5, 2) \cdot C(4, 1) + C(5, 3)$

10. The chess club at a certain school has 10 members of which 6 are seniors and 4 are juniors.

(a) In how many ways can 5 members be chosen for an upcoming tournament? $C(10, 5)$

(b) In how many ways can this group consist of at least 3 seniors?

$$C(6, 3) \cdot C(4, 2) + C(6, 4) \cdot C(4, 1) + C(6, 5)$$