[combinations]

1. Evaluate
    a. $\binom{n}{3}$
    b. $\binom{n}{n-2}$
2. Solve for n; $C(n,2) = 15$
3. Prove:
    a. $C(n,r) = C(n,n-r)$
    b. $C(n,r) = C(n-1,r) + C(n-1,r-1)$
4. In how many ways can a committee of five be selected from four girls and six boys if;
    a. There are no restrictions
    b. There must be two boys and three girls
    c. There must be at least two boys
    d. Sue must be on the committee
    e. Paula and Joe can never serve on the committee together
5. A jar contains six red, three blue, and five green marbles. Three marbles are selected at random. How many different selections are possible?
6. Fifteen people attend a party. How many handshakes will occur if each person shakes hands with every other person at the beginning and end of the party?
7. How many ways can you be dealt a poker hand containing two hearts and three diamonds?
8. How many different pizzas can be made using eight different toppings?
9. Find the number of subsets of {1, 1, 1, 3, 3, 5, 6, 7, 8, 8, 9}.
10. From eight boys and four girls in how many ways can six be chosen under each of the following restrictions?
    a. Exactly one girl is included
    b. At least one girl is included
    c. Mike must always be included
11. In a ten team league, how many league games are there if each team plays all ofther teams twice?
12. A soil chemist has seven different treatments available, and she can apply three different treatments simultaneously in a single experiment. How many experiments must she do to exhaust all triples of treatment?