

# [combinations]

1. Evaluate the following:

a.  $\binom{8}{6}$

b.  $\binom{5}{2}$

c.  $\binom{14}{12}$

d.  $\binom{9}{9}$

e.  $\binom{9}{0}$

f.  $\binom{21}{3}$

g.  $\binom{52}{50}$

h.  $\binom{100}{99}$

i.  $\binom{600}{1}$

2. Find the number of 2-subsets of the set  $\{0, 1, 2, 3\}$ .

3. Find the number of 5-subsets of the set  $\{a, b, c, d, e, f, g\}$ .

4. For the set  $\{1, 2, 3, 4\}$ , find:

a. The number of 0-subsets

b. The number of 1-subsets

c. The number of 2-subsets

d. The number of 3-subsets

e. The number of 4-subsets

f. The total number of different subsets.

5. In how many ways can a committee of three be selected from twelve students?

6. In how many ways can a president, secretary, and treasurer be chosen from twelve students?

7. If fourteen points, no three of which are collinear, are marked on a sheet of paper, how many line segments can be drawn to join pairs of points?

8. Ten friends attend a reunion. Each shakes hands with each of the others. How many handshakes occur?

9. In how many ways can a committee of three men and two women be selected from eight men and six women?

10. In how many ways can a committee of five be selected from six women and eight men if at least three of the committee members must be men?

11. In how many ways can a committee of five be selected from ten men and seven women if at least one of the committee members must be a man?

12. The MMR student council consists of twenty members. In how many ways can a committee of four be selected if the president and secretary must be included?

13. In how many ways can a committee of four be selected from seven women and eight men if Miss Jones refuses to serve on the same committee as Mr. Smith?

14. In how many ways can twelve similar books be placed on three shelves in:

a. Each shelf must contain at least one book?

b. Any or all of the shelves may be used?