Problem 1. Five workers are to be assigned to ten different types of jobs.
(a) If different workers can be assigned to the same type of job, how many job assignments are possible?
(b) If no two workers can be assigned to the same type of job, how many job assignments are possible?

Problem 2. Suppose there are three boys and three girls.
(a) In how many ways can they sit in a row?
(b) In how many ways can they sit in a row if the boys are to sit together and the girls are to sit together?
(c) In how many ways can they sit in a row if only the boys must sit together?
(d) In how many ways can they sit in a row if no two people of the same sex are to sit together?

Problem 3. A child has six black blocks, four red blocks, one white block, and one blue block.
(a) If the child puts the blocks in a line, how many arrangements are possible?
(b) If the child puts the blocks in a (perfect) circle, how many arrangements are possible?

Problem 4. A committee of three women and three men is to be formed from a group of eight women and six men. How many committees are possible if
(a) there are two men who refuse to serve together?
(b) one man and one woman refuse to serve together?
(c) one man and one woman refuse to serve unless they can both serve in the committee?

Problem 5. Expand the following polynomials
(a) \((x^2 + y)^4\)
(b) \((x + 2y + 3z)^3\)

Problem 6. Suppose there are eight new teachers who should be divided among four schools.
(a) If every school should get two teachers, how many assignments are possible?
(b) If every school should get at least one teacher, how many assignments are possible?