

1. In how many ways can 5 people line up for tickets to a show?

120

2. List all the ways in which the positions of president and vice president can be filled from the committee {Susan, Dan, John, Lisa}.

12

3. List all the two-person subcommittees that can be formed from the committee {Susan, Dan, John, Lisa}.

6

4. Four juniors and nine seniors have volunteered to be on a committee for homecoming. If the committee consists of four people, in how many ways can at least one senior be chosen for this committee?

714

5. Find the number of distinguishable permutations for the letters of PROBABILITY.

9,979,200

6. Eight people are going for a ride in a boat that seats eight people. The owner of the boat will drive, and only three of the remaining people are willing to ride in the two bow seats. How many seating arrangements are possible?

720

7. Use Pascal's Triangle to calculate the binomial coefficient.  $\binom{7}{3}$

35

8. Use the Binomial Theorem to expand and simplify the expression.  
 $(3x + y^2)^7$

$$2187x^7 + 5103x^6y^2 + 5103x^5y^4 + 2835x^4y^6 + 945x^3y^8 + 189x^2y^{10} + 21xy^{12} + y^{14}$$

9. Find the 9<sup>th</sup> term in the expansion of the binomial.  
 $(10x - 3y)^{12}$

$$32,476,959,000 x^4 y^8$$