Discrete. Spring 20 Problems for Practice for Test 3.
Also study the quizzes, and the previous two exams!

1. Given universe $\mathcal{U} = \{1, 2, 3, \ldots, 107\}$; $A = \{7, 9, 10, 21, 25\}$; and $B = \{5, 4, 7, 10, 21\}$. Find the following:
   - $|\mathcal{P}(A)|$
   - The number of subsets of B of size 3.
   - $|A \cup B|$
   - $|\overline{A \cup B}|$
2. How many PIN's are there with 7 digits, no repeated digits?
3. How many PIN's are there with 4 digits, no repeated digits, and such that they obey the rule that: either the third digit is 0, the second digit is 2, or the last digit is 1? (more than one requirement can also be true.)
4. How many PIN's are there with 3 digits, repeated digits allowed, and such that the first digit is not 0 and the second digit is not 9?
5. How many ways can 7 students fill in the first row of 4 seats? (seated in order, leaving 3 students still standing.)
6. How many different committees of 4 people can be selected from a group of 10 people?
7. How many ways can 3 books be distributed to 7 shelves on a bookcase? (No ordering of the books on the shelves, just a loose pile.)
8. How many ways can we plan for 3 books to be placed on a bookcase with 7 shelves? (No books on the shelves yet, just the plan.)
9. How many ways are there to put 3 books on the 7 shelves of the bookcase in ordered rows?

10. How many ways can we plan for 3 books to be places on a bookcase with 7 shelves if at least one book must go on the top shelf? (No books yet, just the plan.)

11. How many ways are there to put 3 books on the 7 shelves of the bookcase in ordered rows if at least one book must go on the top shelf?

12. How many ways can 7 books be distributed to 3 shelves on a bookcase? (No ordering of the books on the shelves, just a loose pile.)

13. How many ways can we plan for 7 books to be placed on a bookcase with 3 shelves? (No books on the shelves yet, just the plan.)

14. How many ways are there to put 7 books on the 3 shelves of the bookcase in ordered rows?

15. How many ways can we plan for 7 books to be places on a bookcase with 3 shelves if at least two books must go on the top shelf? (No books yet, just the plan.)

16. How many ways are there to put 7 books on the 3 shelves of the bookcase in ordered rows if at least two books must go on the top shelf?