10.6.1: Combinations- Involving Several Sets (Exercises)

Following problems involve combinations from several different sets.

1. How many 5-people committees consisting of three boys and two girls can be chosen from a group of four boys and four girls?	2. A club has 4 men, 5 women, 8 boys and 10 girls as members. In how many ways can a group of 2 men, 3 women, 4 boys and 4 girls be chosen?
3. How many 4-people committees chosen from 4 men and 6 women will have at least 3 men?	4. A batch contains 10 transistors of which three are defective. If three are chosen, in how many ways can they be selected with two defective?
5. In how many ways can five counters labeled A, B, C, D and E at a store be staffed by two men and three women chosen from a group of four men and six women?	6. How many 4-letter word sequences consisting of two vowels and two consonants can be made from the letters of the word PHOENIX if no letter is repeated?

Three marbles are chosen from an urn that contains 5 red, 4 white, and 3 blue marbles. How many samples of the following type are possible?

7. All three white.	8. Two blue and one white
9. One of each color.	10. All three of the same color.
11. At least two red.	12. None red.

The following problems involve combinations from several different sets.

Five coins are chosen from a bag that contains 4 dimes, 5 nickels, and 6 pennies. How many samples of five coins of the following types are possible?

13. At least four nickels.	14. No pennies.
15. Five of a kind.	16. Four of a kind.
17. Two of one kind and two of another kind.	18. Three of one kind and two of another kind.

Find the number of different ways draw a 5-card hand from a deck to have the following combinations.

19. Three face cards.	20. A heart flush (all hearts).
21. Two hearts and three diamonds	22. Two cards of one suit, and three of another suit.
23. Two kings and three queesns.	24. 2 cards of one value and 3 of another value

The party affiliation of the 100 United States Senators in the 114^{th} Congress, January 2015, was:

44 Democrats, 54 Republicans, and 2 Independents.

25. In how many ways could a 10 person committee be selected if it is to contain 4 Democrats, 5 Republicans, and 1 Independent?	26. In how many different ways could a 10 person committee be selected with 6 or 7 Republicans and the Democrats (with no Independents)?

The 100 United States Senators in the 114^{th} Congress, January 2015, included 80 men and 20 women. Suppose a committee senators is working on legislation about wage discrimination by gender.

27. In how many ways could a 12 person committee be selected to contain equal numbers of men and women.	28. In how many ways could a 6 person committee be selected to contain fewer women than men?

Jorge has 6 rock songs, 7 rap songs and 4 country songs that he likes to listen to while he exercises. He randomly selects six (6) of these songs to create a playlist to listen to today while he exercises.

How many different playlists of 6 songs can be selected that satisfy each of the following: (We care which songs are selected to be on the playlist, but not what order they are selected or listed in.)

29. Playlist has 2 songs of each type	30. Playlist has no country songs
31. Playlist has 3 rocks, 2 raps, and 1 country song	32. Playlist has 3 or 4 rock songs and all the rest are rap songs

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