Time Frame: 50 minutes

Subject Matter: Probability and Counting Rules

TELL ME

Anticipatory Set:

A committee of 4 people is to be formed from 6 doctors and 8 dentists. Find the probability that the committee will consist of

1. All dentists
2. 2 dentists and 2 doctors
3. All doctors

Objective: TSWBAT find the probability of an event using the counting rules.

Standards: DA – 5.2 Use counting techniques to determine the number of possible outcomes for an event.

Materials: PowerPoint Presentation and Worksheets

SHOW ME

Presentation of Information:

*Review the following.*

*Permutation Rule*

* The arrangement of *n* objects in a specific order using *r* objects at a time is called a *permutation of n objects taking r objects at a time*. It is written as nPr, and the formula is

$$nPr= \frac{n!}{\left(n-r\right)!}$$

*Combination Rule*

* The number of combinations of r objects selected from n objects is denoted by nCr, and the formula is

$$nCr= \frac{n!}{\left(n-r\right)!r!}$$

Example:

 An insurance sales representative selects three policies to review. The group of policies she can select from contains 8 life policies, 5 automobile policies, and 2 homeowner’s policies. Find the probability of selecting

1. All life policies.
2. Both homeowner’s policies.
3. All automobile policies.
4. 1 of each policy
5. 2 life policies and 1 automobile policy.

Le Me Try (Study Guide)

Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Period: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: Dec. 1, 2010

1. A drawer contains 11 identical red socks and 8 identical black socks. Suppose that you choose 2 socks at random in the dark.
2. What is the probability that you got a pair of red socks?
3. What is the probability that you get a pair of black socks?
4. What is the probability that you get 2 unmatched socks?
5. Find the probability of selecting 3 science books and 4 math books from 8 science books and 9 math books. The books are selected at random.
6. When 3 dice are rolled, find the probability of getting a sum of 7?
7. Find the probability of randomly selecting 2 mathematics books and 3 physics books from a box containing 4 mathematics books and 8 physics books.
8. Find the probability that if 5 different – sized washers are arranged in a row, they will be arranged in the order of size.

Review Exercises

1. When a die is rolled, find the probability of getting a
2. 5
3. 6
4. Number less than 5
5. When a card is selected from a deck of cards, find the probability of getting
6. A club
7. A face card or a heart
8. A 6 and a spade
9. A king
10. A red card
11. In a survey conducted at a local restaurant during breakfast hours, 20 people preferred orange juice, 16 preferred grapefruit juice, and 9 preferred apple juice with breakfast. If a person is selected at random, find the probability that she or he prefers grapefruit juice.
12. During a sale at a men’s store, 16 white sweaters, 3 red sweaters, 9 blue sweaters, and 7 yellow sweaters were purchased. If a customer is selected at random, find the probability that he bought
13. A blue sweater.
14. A yellow or a white sweater.
15. , A red, a blue, or a yellow sweater.
16. A sweater that was not white.
17. At a swimwear store, the managers found that 16 women bought white bathing suits, 4 bought red suits, 3 bought blue suits, and 7 bought yellow suits. If a customer is selected at random, find the probability that she bought
18. A blue suit.
19. A yellow or a red suit.
20. A white or a yellow or a blue suit.
21. A suit that was not red.
22. When two dice are rolled, find the probability of getting
23. A sum of 5 or 6.
24. A sum greater than 9.
25. A sum less than 4 or greater than 9.
26. A sum that is divisible by 4.
27. A sum of 14.
28. A sum less than 13.