

# Assignment

## Write

Describe a scenario that might use the formula  ${}_n C_r (p)^r (1 - p)^{n-r}$ . What do each of the variables represent in the formula?

## Remember

The arrangements represented by  ${}_n C_r$  can also be computed using Pascal's Triangle.

## Practice

1. A number cube has 5 green sides and 1 orange side.
  - a. What is the probability of 4 green outcomes and 1 orange outcome when the number cube is rolled 5 times?
  - b. What is the probability of 2 green outcomes and 2 orange outcomes when the number cube is rolled 4 times?
  - c. What is the probability of 3 green outcomes and 4 orange outcomes when the number cube is rolled 7 times?
2. A bag contains 3 nickels and 1 penny. Coins are replaced in the bag after every choice.
  - a. What is the probability of randomly choosing 4 nickels and one penny in 5 trials?
  - b. What is the probability of randomly choosing 2 nickels and 3 pennies in 5 trials?
  - c. What is the probability of randomly choosing 1 nickel and 5 pennies in 6 trials?
  - d. What is the probability of randomly choosing 4 nickels and 3 pennies in 7 trials?

## Stretch

1. A student is taking a multiple choice quiz. There are 10 questions on the quiz, and each question has 5 possible responses. The student has to guess on each question because he did not study for the quiz.
  - a. What is the probability that the student gets at least a 70% on the quiz? Show your work.
  - b. Is there a good chance the student will pass the quiz by guessing? Explain your reasoning.

## Review

1. Sylvia is at an ice cream parlor that has 20 different flavors of ice cream. She is going to have a bowl of ice cream with two scoops. How many different ways can the scoops be chosen? State whether the question uses permutations or combinations. Then calculate the answer.
2. How many different ways can the letters in the word MATHEMATICS be arranged?

3. A school is giving out prizes at a pep rally to random students whose names are picked out of a hat. The table shows the numbers of students in each grade. Suppose each time a student's name is chosen, the student's name does not go back into the hat. The principal draws three names. What is the probability that the first student is in eleventh grade and the third student is in eleventh grade?

Number of Students	Grade of Student
25	ninth
32	tenth
28	eleventh
25	twelfth

4. Two bags of marbles are used for a game with the given content.

Bag A: 6 red, 5 blue, 4 white

Bag B: 6 green, 5 orange, 4 purple, 3 black

A player chooses two marbles from Bag A. What is the probability that the player will choose a red marble first or a white marble second?

5. Consider the graph shown. Identify the key characteristics.
  - a. Intervals where the function is increasing or decreasing
  - b. Minimum and/or maximum values of the function
  - c.  $x$ - and  $y$ -intercept(s)

