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Worksheet 13.4

**Find the number of permutations.**

(1) Ways to arrange the letter in the word GUITAR.

(2) Ways to arrange 7 DVDs on a shelf.

(3) Ways to choose a president, vice president, secretary, and treasurer from the 18 members of a club.

(4) Ways to choose first, second, and third prize from 27 posters in a contest.

(5) Decide whether the list below contains all of the permutations of the 3 symbols. If the list is incomplete, determine which permutations are missing.

**Find the number of combinations.**

(6) Ways to choose 3 different kinds of apples from the following kinds: Red Delicious, Granny Smith, Empire, McIntosh, and Fuji.

(7) Ways to choose 4 different colors from the following colors: red, blue, purple, yellow, green, and orange.

(8) Ways to choose 8 students to be extras in a play from 14 students.

(9) Ways to choose 4 different fish from 26 kinds of fish.

**As part of a magic trick, you are asked to choose a number of cards from a deck of 52 cards.**

(10) How many ways can you choose 4 cards from the deck, if the order in which the cards is chosen in not important?

(11) How many ways can you choose 6 cards from the deck, if the order in which the cards are chosen is important?

**Tell whether the situation describes a *permutation* or *combination.* Then answer the question.**

(12) How many ways can a disc jockey choose 4 different songs from 10?

(13) How many ways can you choose 3 different pizza toppings from 15?

(14) How many ways can a judge award first, second, and third places at a science fair with 23 entries?

(15) How many ways can the coach arrange the batting order of the 9 starting players of a baseball team?

(16) How many different 3-digit numbers can you make using the digits 1, 4, 5, 6, 8, and 9, if no digit appears more than once in the number?

**MIXED REVIEW**

**You randomly choose a marble from the marbles below. Find the probability of choosing a marble of the given color. Write the probability as a fraction, decimal, and a percent.**

(17) Red (18) Blue (19) Purple (20) Green