

1. (10 points) Library/Rochester/setAlgebra38Counting/sw10_1_3

3.pg

4 -letter "words" are formed using the letters A, B, C, D, E, F, G. How many such words are possible for each of the following conditions?

(a) No condition is imposed.

Your answer is : _____

(b) No letter can be repeated in a word.

Your answer is : _____

(c) Each word must begin with the letter A.

Your answer is : _____

(d) The letter C must be at the end.

Your answer is : _____

(e) The second letter must be a vowel.

Your answer is : _____

2. (2 points) Library/UMN/algebraKaufmannSchwitters/ks_15_2_28

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How many different 7-letter permutations can be formed from 5 identical H's and two identical T's?

Answer: _____

3. (4 points) Library/NAU/setCounting/Counting_15.pg

A 5-card poker hand is dealt at random from a standard 52-card deck. What is the total number of possible hands? _____

What is the total number of possible hands if the hand contains exactly one heart? _____

4. (2 points) Library/Mizzou/Finite_Math/Set_Theory_Permutations_Combinations/7cardPokerhand.pg

A standard deck of cards consists of four suits (clubs, diamonds, hearts, and spades), with each suit containing 13 cards (ace, two through ten, jack, queen, and king) for a total of 52 cards in all.

How many 7-card hands will consist of exactly 4 hearts and 2 clubs?

5. (6 points) Library/ASU-topics/setDiscrete/stef4-5b.pg

You have 24 cards and 10 envelopes (labeled 1,2, ...,10). In how many ways can you put the 24 cards into the envelopes if

(a) The cards are distinct?

Answer = _____

(b) The cards are identical?

Answer = _____

(b) The cards are identical and no envelope can be left empty?

Answer = _____

6. (2 points) Library/NAU/setCounting/Counting_13.pg

A bowl contains 5 red balls and 8 blue balls. A woman selects 4 balls at random from the bowl. How many different selections are possible if at least 3 balls must be blue? _____

7. (2 points) Library/NAU/setCounting/PermutationsCombinations_1.pg

You are rearranging your bookshelf to make it more interesting and harder to find anything on it. On one of the shelves you plan to put 13 biographies and 6 mysteries. How many ways can you arrange them on the shelf if you don't want any two mystery books next to each other (i.e. they need to be separated by at least one biography, maybe more...).

8. (2 points) Library/NAU/setCounting/RepeatedCombination1.pg

How many anagrams can be created from the word 'needlessly' if the new words do not need to be meaningful?

9. (8 points) Library/NAU/setCounting/counting1.pg

There are 11 portable mini suites (a.k.a. cages) in a row at the Paws and Claws Holiday Pet Resort. They are neatly labeled with their guests' names. There are 5 poodles and 6 tabbies. How many ways can the "suites" be arranged if:

a) there are no restrictions.

b) cats and dogs must alternate.

c) dogs must be next to each other.

d) dogs must be next to each other and cats must be next to each other.

10. (2 points) Library/Mizzou/Finite_Math/Set_Theory_Permutations_Combinations/CaptainTwoAlternates.pg

How many ways can a team of 29 hockey players choose a captain and two alternate captains?

11. (6 points) Library/NAU/setCounting/counting2.pg

Page Turner loves discrete mathematics. She has 5 "graph theory" books, 6 books about combinatorics, and 3 "set theory" books.

How many ways can she place her discrete mathematics books on the same shelf in a row if:

a) there are no restrictions.

b) graph theory books are next to each other but the others could be anywhere on the shelf.

c) books are organized by their topic (same kinds are next to each other).

12. (4 points) Library/NAU/setCounting/generalizedCombination1

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Santa's elves are creating treat bags containing a selection of Kit Kats, Reese's cups and Almond Joys.

(A) How many different types of bags can they make containing 14 chocolate bars.

(B) How many different types of bags can they make containing 14 chocolate bars if Santa wants to have at least 1 Kit Kat(s), 1 Reese's cup(s) and 2 Almond Joy(s) in the bag.

13. (4 points) Library/Mizzou/Finite_Math/Set_Theory_Permutati

ons_Combinations/Printers.pg

A company received a shipment of 43 laser printers, including 6 that are defective. 3 of these printers are selected to be used in the copy room.

(a) How many selections can be made? _____

(b) How many of these selections will contain no defective printers? _____

14. (4 points) Library/NAU/setCounting/counting3.pg

The annual National No Spying Day is celebrated at KAOS headquarters this year. There are 12 Control agents and 16 KAOS agents attending. How many ways can we choose a team of 7 agents if 2 team members need to be from Control and 5 from KAOS?

How many ways can we choose a team of 7 agents if at least 1 team member needs to be from Control?

15. (6 points) Library/ASU-topics/setDiscrete/stefi4-5a.pg

A store is selling 5 types of hard candies: cherry, strawberry, orange, lemon and pineapple. How many ways are there to choose:

(a) 24 candies?

Answer = _____

(b) 24 candies with at least a piece of each flavor?

Answer = _____

(b) 24 candies with at least 2 cherry and at least 6 lemon?

Answer = _____