

CMSC 250 Homework 11 Fall 2005 0201 & 0202

Due Wed Nov 16 at the beginning of your discussion section.

You must write the solutions to the problems single-sided on your own lined paper, with all sheets stapled together, and with all answers written in sequential order or you will lose points.

Answer the following questions about the Halloween candy you got this year trick-or-treating. You must explain in english what formula(s) you are using and why - then you must show all work before the answer in order to receive full credit.

The answer only needs to be taken to a form that includes only addition, subtraction, multiplication, division, factorials, and exponents. You do not need to evaluate those to a number.

1. If you recieved 20 pieces of candy where every one is different from the others, answer the following questions: (note: creating a pile or giving a selection of the candies to some other person does not imply an order in those candies, eating them is sequential and does imply order)
 - (a) How many ways can you select which three to give to your brother (because your mother told you to share)?
 - (b) How many ways can you eat them all quickly (one after the other) so you don't have to share any with your brother?
 - (c) Assuming you want to eat seven of them now quickly (one after the other) now and save the others for anohter day, how many different ways could you do this?
 - (d) How many ways can you divide them into two piles so you can give one pile to your brother and keep the other (it may be the case that one of you gets none and the other gets all)?
 - (e) Assuming your brother's two friends have come over, and now you need to divide them up into 4 piles (again where one or more of the piles could be empty) - how many ways could you divide them up?
 - (f) You decide in order to "share" the candy as your mother told you, you will give two candies to your brother, and one to each of his two friends, and then you will keep the others in the bag you trick-or-treated with. How many different ways can you distribute the candy?

Continue with Problems on the back

2. If you received 20 candies that were all exactly the same (a very boring neighborhood for trick-or-treaters), answer the following questions: (the note from above applies here also)
 - (a) How many ways can you select which three to give to your brother (because your mother told you to share)?
 - (b) How many ways can you eat them all quickly (one after the other) so you don't have to share any with your brother?
 - (c) How many ways can you divide them into two piles so you can give one pile to your brother and keep the other (it may be the case that one of you gets none and the other gets all)?
 - (d) Assuming your brother's two friends have come over, and now you need to divide them up into 4 piles (again where one or more of the piles could be empty) - how many ways could you divide them up?
 - (e) You decide in order to "share" the candy as your mother told you, you will give two candies to your brother, and one to each of his two friends, and then you will keep the others in the bag you trick-or-treated with. How many different ways can you distribute the candy?

3. If you received 20 candies where 10 of them were Snickers bars, 7 were Twizlers and 3 were Hershey's Kisses, answer the following questions: (the note from above still applies) (also, note two candies of the same brand/type are indistinguishable from each other)
 - (a) How many ways can you select which three to give to your brother (because your mother told you to share)?
 - (b) If you reach into the bag of candy and pull one out randomly, what is the probability that it is a Hershey's Kiss?
 - (c) If you reach into the bag of candy and pull one out randomly and put it back into the bag and then pull a candy out randomly, what is the probability they will be the same?
 - (d) If you line all of the candies up in a row (deciding what order to eat them), how many different possible rows could you make with this bag of candy?