

Instructions: For each of the situations below, list all the possible ways the situation can be satisfied differently. Pay special attention to whether order matters or does not matter.

Examples:

- i. Suppose that three people are standing in line. How many different ways can Aaron, Beatrice and Caleb stand?
Answer: ABC, ACB, BAC, BCA, CAB, CBA (here order matters)
- ii. Suppose that you have four friends and want to take two of them to dinner. What are all ways you can take two friends to dinner? Suppose your friends are named Zack, Yvette, Xavier, and Wilson.
Answer: WX, WY, WZ, XY, XZ, YZ (that is all, since both are going to dinner, it doesn't matter which order they are in)

1. In order to divide two chores (taking out the trash and mowing the lawn) up among three kids, you assign them randomly to each child each week. One child could get both, one or no chores in any given week. If the kids are named Karmen, Jose and Lindsay, what are all the ways the chores can be divided up?

KL KJ KK
JK JJ JL
LK LJ LL

What is the probability that Jose does at least one chore this week?

$$\frac{5}{9}$$

2. You have four gifts to give friends. They are all different. Your friends are Mo'Ne, Nellie, Obadiah, and Pat. What are all the ways you can give out the gifts?

MNOP NMOP OMNP PMNO
MNPO NMPO OMPN PMON
MPNO NOMP ONMP PNOM
MPON NOPM ONPM PNMO
MOPN NPMO OPMN POMN
MONP NPOM OPNM PONM

Assume the list corresponds to the price of the gifts. What is the probability that Mo'Ne got the second-most expensive gift?

$$\frac{6}{24} = \frac{1}{4}$$

3. Suppose you have two identical gifts to give to some of your friends. You have three women friends Polly, Martha and Sara. And three male friends: Omar and Ahmed. What are all the way you can give those gifts out to two of your friends. You can assume that no one gets both gifts.

PM
PS
PO
PA
MS
MO
MA
SO
SA
OA

What is the probability that both of the gifts go to women?

$$\frac{3}{10}$$