

## GGM WEEK 2 - Stars and bars

FREE video explanation of topic: <https://www.youtube.com/watch?v=6QnXUh9w5iM>

1. Farmer Jones is herding his sheep into 3 pens. He has 10 sheep and wants to put at least one sheep but no more than 8 sheep in each pen. How many ways can he do this?
2. A teacher must give 11 lollipops to their 5 students. If every student but one must have an even number of lollipops, how many ways are there to distribute the lollipops?
3. 5 plants are to be given away to 3 people, such that no person has more than 3 plants. How many ways are there to do this?
4. There are 5 children, 5 adults, and 25 chocolate bars. If every child needs an even number of chocolate bars and every adult needs an odd number, how many possible ways are there to distribute the chocolate bars?
5. Anna lists out the possible ways to give 6 indistinguishable coins to Bert, Clara, and David. She then picks one of the arrangements. What is the probability that, in the picked arrangement, Bert is given at least 3 coins?
6. Donald constructs a rectangular prism with integer dimensions  $a$ ,  $b$ , and  $c$  and volume 72. Find how many ordered pairs  $(a, b, c)$  exist.
7. Let there be 15 cubes and 4 people, and call a *nice* distribution of cubes be one in which each person has a number of cubes that is a multiple of 3. Find the ratio of the number of nice arrangements to all arrangements.