

1. In how many ways can the letters *hannah* be arranged?
2. Twelve kids are playing duck-duck-goose (remember how you sit in this game???). In how many different arrangements can they sit?
3. Lucy is selecting a group of 6 tutors from the 17 Advanced English students. In how many different ways can she choose this group of 6?
4. Mary has \$2.50 in quarters. She plans to give the first person chosen 4 quarters, the second person 3 quarters, etc. until her money runs out. In how many different ways can she give out quarters to her 11 closest friends?
5. There are 3 blue, 2 red, and 5 white marbles in a jar. What is the probability when choosing one at a time that a) the first will be red and the second blue with replacement? B) the first is white and the second is white, without replacement?
6. When rolling two dice once, what is the probability of getting: a) a sum of 5 b) a sum of 6 or a multiple of 3? c) a sum greater than 2?
7. Mrs. Devine is lining up her 21 first graders. In how many different arrangements can she line up her class?
8. There are 4 red, 3 blue and 5 white marbles in a jar. When grabbing 7 marbles in one grab, what is the probability that you will choose 2 red, 1 blue and 4 white marbles?
9. In order to leave class you must first roll a multiple of 3 on a die, then get a tails on a coin, followed by choosing a king from a deck of cards. What are the chances of you leaving the first time?
10. Mary is ordering a 3-topping pizza. There are 11 ingredients from which to choose. How many different kinds of pizza are available to her?

Answers:

1. 90
2. 39,916,800
3. 12,376
4. 7920
5. A)  $\frac{3}{50}$  B)  $\frac{2}{9}$
6. A)  $\frac{1}{9}$  B)  $\frac{1}{3}$  C)  $\frac{35}{36}$
7. 21!  $5.109094217 \times 10^{19}$
8.  $\frac{5}{44}$
9.  $\frac{1}{78}$
10. 165