

Hanes Magnet Math Club Worksheet 01 Fall 2017

Warm-up problems: mental math

What is $57 \times 135 =$?

Permutations and Combinations

A bag contains 5 chips with numbers 2,3,4,5,6 on them.

1. Danya draws chips out one at a time and lines them up according to the order the chips are drawn. How many different orders are there?

2. If Danya draws three chips at a time, how many different results are possible? For example, (2, 4, 5) is such a possibility.

3. Danya draws chips out one at a time and lines them up according to the order they are drawn. What is the probability that the first chip drawn has an odd number on it?

4. Danya draws chips out one at a time and lines them up according to the order they are drawn. What is the probability that the second chip drawn has an odd number on it? Why?

5. Danya draws chips out one at a time and lines them up according to the order they are drawn. What is the probability that the first two chip drawn have even numbers on them? Why?

6. Danya draws chips out one at a time and line them up according to the order they are drawn. What is the probability that the sum of the numbers on the first few chips is 10?

7. A team of 6 baseball players has numbers on their baseball hats: 2,3,4,5,6,7. Their hats are put in a bag and well mixed. Danya draws the hats out of the bag one at a time and puts them back on the players' heads according to the order the hats are drawn. What is the probability that exactly three players get their their own hat? What is the probability that no one gets their own hat? (This is called the *derangement* problem).