

Probability

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Class Discussion

Probability. Equally probable outcomes.

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Warm Up

Exercise 1. Tanya wants to create a math team of 4 people out of her class of 10 students. As everyone is approximately the same strength, she decided to use a lottery. What is the probability that a given student will get on the team?

Exercise 2. If I roll two standard dice, what sum am I most likely to achieve on them?

Problem Set

Exercise 3. A math team has 8 members, 5 girls and 3 boys. Two members are chosen at random for the speed counting round. What is the probability that they are both girls?

Exercise 4. When you pick a 7-digit number randomly, what is the probability that it is a palindrome?

Exercise 5. What is the probability that a random arrangement of the letters of my name Tanya will have both A's next to each other?

Exercise 6. You are given a random permutation of 5 letters. If you apply this permutation to my first name Tanya, then what is the probability that it stays unchanged?

Exercise 7. When flipping a coin 6 times, what is the probability of getting exactly 4 heads?

Exercise 8. Tanya decided to buy balloons for her math party. There are 7 colors of balloons at the Star Market and Tanya needs 10 balloons. In how many ways can Tanya buy her balloons?

Exercise 9. When picking three set cards at random, what is the probability of getting a set?

Exercise 10. Simplify:

$$\left((\sqrt[4]{p} - \sqrt[4]{q})^{-2} + (\sqrt[4]{p} + \sqrt[4]{q})^{-2} \right) / \frac{\sqrt{p} + \sqrt{q}}{p - q}.$$

Exercise 11. For drafting purposes the government made a list of all the families with two children where at least one of the children is a boy. A family from this list is picked at random. What is the probability that this family has two boys?