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Activity Sheet for the October, 2019, MATHCOUNTS Mini

Warm-Up!

Try these problems before watching the lesson.

1. The Charleston Dodgeball Team has 16 players at a tournament match. If each player is equally likely to be chosen as one of the 10 starters, what is the probability that the Charleston player Joe "The Arm" Morez will start? Express your answer as a common fraction.

2. A box contains 7 blue bows, 3 red bows, and 8 yellow bows. Given that one bow is selected at random, what is the probability that it is not a red bow? Express your answer as a common fraction.

3. A fair coin is flipped 37 times. What is the probability that the total number of heads is greater than the total number of tails?

4. A point is selected at random from the interval $-10 \leq x \leq 10$. What is the probability that the coordinate of the point is a solution of $x \geq 7$? Express your answer as a common fraction.

The Problems

First Problem: Two points are randomly placed on a number line from -1 to $+1$. What is the probability that the origin lies between the two points? Express your answer as a common fraction.

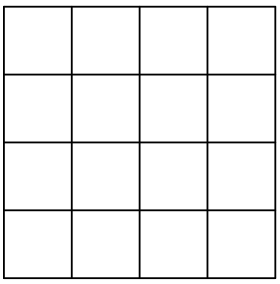
Second Problem: Eliza creates a custom 6-sided die by randomly choosing six distinct integers from 1 to 7, inclusive, to paint onto the sides of a blank cube. She tells Philip that the faces of her die have a sum of 24. Philip rolls the die. What is the probability that Philip's die shows a prime number on the top face? Express your answer as a common fraction.

Follow-up Problems

5. There are 11 students in Ms. McGinn's Chemistry class, including the Baker triplets: Annika, Billy, and Catherine. The teacher calls all 11 students in random order one at a time to her desk to tell each student his or her final grade. What is the probability that Billy is the first of the triplets that she calls to her desk?

6. Two of the vertices of a regular octagon are to be chosen at random. What is the probability that they will be the endpoints of a side of the octagon?

7. In the 4-by-4 grid of unit squares shown, two coins will be placed at random such that each coin is in a different unit square. What is the probability that the two coins will not lie in the same row or column of unit squares? Express your answer as a common fraction.



8. Shannon breaks a straight stick into two pieces at a randomly chosen point. What is the probability that the longer piece is more than twice as long as the shorter piece?

Share Your Thoughts

Have some thoughts about the video? Want to discuss the problems on the Activity Sheet? Visit the MATHCOUNTS Facebook page or the Art of Problem Solving Online Community (www.artofproblemsolving.com).