

2003 Washington State Math Championship

Unless a particular problem directs otherwise, give an exact answer or one rounded to the nearest thousandth.

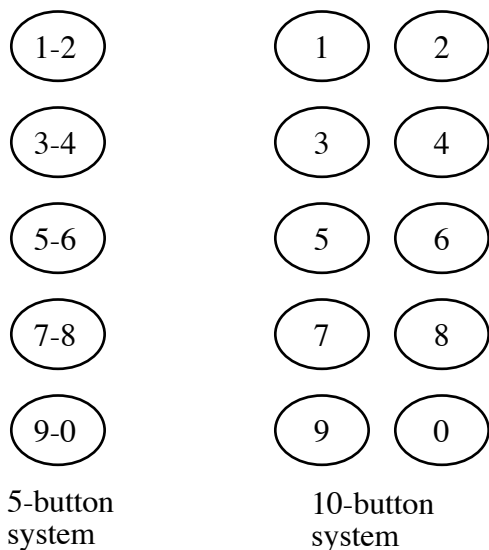
Probability - Grade 7

1. What is the probability that a randomly selected 2 digit number is prime? Answer as a reduced fraction.
2. A drawer contains 18 socks, some black and some white. Two socks are randomly drawn from the drawer. The probability that both socks are black is $\frac{26}{51}$. How many socks in the drawer are white?
3. At gasoline pumps the number of gallons of gasoline delivered is measured to the nearest thousandth of a gallon. The pump shuts off automatically when the gas tank is full. For example, when Phil Uppe got gas last week, the pump shut off at 12.633 gallons. At a random fill-up the last 3 decimal places can be thought of as a random number generator. What is the difference in the probability that the last 3 decimal places are 724 and that they are 000?
4. Foot Draggers sold the following sizes of basketball shoes last month. Based on this data, what is the probability that the next customer who buys basketball shoes will buy a half-size? Answer to the nearest thousandth.

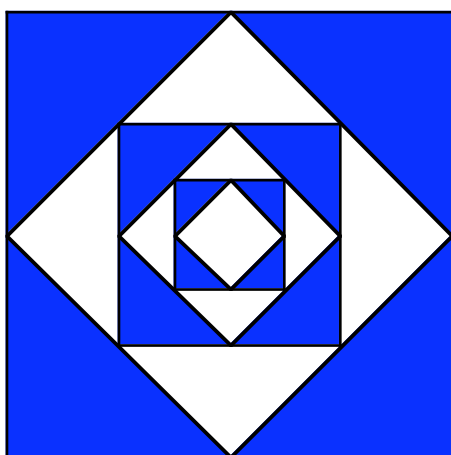
Size	7	$7\frac{1}{2}$	8	$8\frac{1}{2}$	9	$9\frac{1}{2}$	10	$10\frac{1}{2}$	11
Number sold of each size	2	5	9	15	19	16	7	6	3

5. Two dice are rolled. What is the probability that the absolute value of their difference is greater than 2?
6. Two dice are rolled. What is the probability of getting a six on either die or a sum of 6 on both dice?

7. A security gate at the marina can be opened with four-digit access codes, for example, 0384. Each person needing access through the gate is given a own code by the marina. Richard tries some random four-digit numbers and discovers that 1234 opens the gate. However, the marina changes the security system from a 5-button system to a 10-button system (pictured below) so that all the members 4-digit codes still work. Richard discovers that 1234 does not work. What is the minimum number of 4-digit codes that Richard needs to try to be sure of opening the security gate?



8. In the previous problem the marina's change from a 5-button to a 10-button system makes possible how many more 4-digit codes?
9. The outside figure is a square. Other squares are formed by connecting the midpoints of the sides of the squares. If a point in the figure is selected at random, what is the probability that it is shaded? Answer as a reduced fraction.



10. Ichiro's on-base average (the probability of getting on base at any at-bat) is 0.418 . Mark's is 0.384 , and John's is 0.408 . If these three come to bat in the same inning, what is the probability, to the nearest thousandth, that none get on base?