

$$B > \frac{1}{n} \sum_{i=1}^n x_i$$

(Be greater than average)

Probability and Statistics 6th Grade

- 2 points:** Mr. Humpty and Mr. Dumpty were both very strict teachers. Out of the 120 kids in the seventh grade, 56 had Mr. Humpty as their teacher, 46 had Mr. Dumpty as their teacher, and 30 had both teachers. How many seventh graders did **not** have Mr. Humpty or Mr. Dumpty, and thus had a great fall semester?
- 2 points:** Suppose that 4 uniquely colored bracelets are placed into 4 different cups. Each cup is randomly given one of the following labels, representing each of the 4 unique colors: blue, red, yellow, or green. What is the probability that the color of the bracelet in each cup will match the color of each cup's label? **Express your answer as a reduced fraction.**
- 2 points:** After not doing laundry for three weeks, Jon looks into his closet to choose his outfit for the day. He has 2 striped shirts, 1 polka-dotted shirt, and 1 shirt covered in math jokes. He also has 1 pair of brown pants, 1 pair of black pants, and 1 pair of neon-pink pants. If he were to choose one shirt and one pair of pants as his outfit, what is the probability that his outfit will contain neither his math shirt nor his neon-pink pants? **Express your answer as a reduced fraction.**
- 3 points:** In a group of 10 children, the mean, median, mode, and range of the ages are all equal. If nine of the ages are 3, 4, 4, 5, 5, 5, 5, 6, and 8, what is the age of the 10th child?
- 3 points:** What is the probability that a randomly chosen three-digit number will consist of only odd or only even digits? **Express your answer as a reduced fraction.**
- 3 points:** Gary's final two tests of the year count for 30% of his final grade, whereas each of his first 7 tests counted for 10% of his final grade. If Gary's percentages on the first seven tests were 75%, 80%, 58%, 60%, 80%, 100%, and 65%, what must his average be on the final two tests in order to scrape by with an 80% overall grade in the class? **Express your answer as a percent.**
- 3 points:** In the local calculator factory, there are two quality checkpoints. At the first checkpoint, 95% of the calculators are found to be fine, and 5% are found to have an error and are tossed in the garbage. At the second quality checkpoint, 20% of the remaining calculators are found to not be of high enough quality and are also tossed in the garbage, and the rest are sent to stores to be sold. What is the probability that a calculator that is made will be sent out to stores? **Express your answer as a percent.**
- 4 points:** A coach has a group of 10 tennis players that applied for a team – 5 girls and 5 boys. If a team must consist of 2 boys and 2 girls, how many unique teams could the teacher make?

9. **4 points:** If two positive digits are randomly chosen, with replacement, and used as the numerator and denominator of a fraction, what is the probability that the fraction will be less than one and in simplest form? **Express your answer as a reduced fraction.**
10. **4 points:** Two fair six-sided dice are tossed. One has the numbers 1 through 6 and the second has the numbers 3 through 8 on its six sides. What is the probability that the number showing on the second die will be less than or equal to the number showing on the first die? **Express your answer as a reduced fraction.**