

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

(Be greater than average)

Probability and Statistics 8th Grade

- 2 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.**
- 2 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?
- 2 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.**
- 3 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.**
- 3 points:** A dartboard is made up of three circles that share a common center. These circles have radii of 1, 3, and 5. Assuming that a dart thrown by James has an equal chance of landing anywhere on the dartboard, what is the probability that the dart will hit within the circle with the radius of 3 but outside the circle with the radius of 1? **Express your answer as a percent.**
- 3 points:** On a piano, a chord is often created by playing three notes at the same time. If there are 8 unique white keys and 5 unique black keys to choose from, how many unique chords can be played, given that a chord is made up of 2 white keys and 1 black key?
- 3 points:** Dr. Trytoohard has devised an evil plan to control a 4-way intersection's traffic lights. With one push of a button, it will randomly choose either red or green for each of the four lights. If two adjacent lights, such as the northern and eastern lights, are both lit up as green, an accident will happen. What is the probability that an accident will happen when he presses the button? **Express your answer as a reduced fraction.**
- 4 points:** When dealing from a standard 52-card deck of playing cards, what is the probability that the first four cards will be two hearts and two diamonds in any order? **Express your answer to the nearest tenth of a percent.**

9. **4 points:** Paulina places 10 red poker chips and 6 blue poker chips in a hat. She draws a chip first without looking and places it behind her back; then she draws a second chip out. Given that she draws a red chip the second time, what is the probability that she also drew a red chip the first time? **Express your answer as a reduced fraction.**
10. **4 points:** Trying to pass the time while watching what seems like your brother's one-millionth soccer game this year, you take a standard, fair six-sided die out of your pocket and roll it. Each time that you roll a multiple of 3, you take one step to your right. Each time that you roll a number that is not a multiple of 3, you take one step to your left. If you roll the die 8 times, what is the probability that you will end up no more than one step away from where you began? **Express your answer to the nearest whole percent.**