**S12**

**Normal Distribution and z-scores**

* A normal distribution is a probability distribution around a central value, dropping off symmetrically to the right and left, forming a bell-like shape.
* The mean and median are equal.
* You can determine the probability that a variable will lie within a range of values by finding an area under the normal distribution.
* You can use z-scores to determine probabilities, either from a table of by using technology.

Normal Distribution = Bell Curve

**68-95-99.7 Rule**

Note: You must use a range of values to determine the theoretical probability for continuous random variable. The probability that a continuous random variable takes on any single value is zero.

Example 1: Kunal is trying out for the school football team. He wants to know how far he can kick the ball for a field goal. The table shows the data from 20 trials.

|  |
| --- |
| Field Goal Distance [yd] |
| 17 | 27 | 31 | 25 | 25 |
| 44 | 35 | 24 | 31 | 48 |
| 42 | 48 | 45 | 34 | 41 |
| 38 | 40 | 43 | 45 | 21 |

1. Determine the mean and the standard deviation. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_
2. What is the probability that Kunal kicks a distance of less than 30 yd?
3. What is the probability that Kunal kicks a distance of 20yd-40yd?