QUIZ 5 -SOLUTION

A soda machine automatically dispenses a certain amount of soda into a cup, but because the volume of ice cannot be controlled exactly, the amount of soda plus ice varies from cup to cup. For 12 ounce cups, the amount of soda and ice that are dispensed has an approximately bell shaped distribution with a mean of 11.8 fluid ounces. Lately, the machine has been out of calibration resulting in a standard deviation of 0.1 fluid ounces for the amount dispensed.

2 pts What is the approximate probability that a cup will overflow?

Use the Empirical Rule. Overflowing means being 2 standard deviations above the mean. This occurs with probability 0.05/2 or 2.5% of the time.

2 pts If 5 cups are purchased what is the probability that none of them overflow.

Probability that one cup does not overflow is 1 - .025 = .975

Probability that all 5 do not overflow is $(0.975)^5$

2pts What "rules" and "assumptions" did you use to solve this problem?

The Empirical Rule

all cups have the same probability of overflowing.

Independence of events – if one cup overflows, this outcome does not affect the outcomes of whether or not the other cups overflow.