

An aid agency is packaging bags of seeds for distribution in a community where farmers have been unable to save enough seeds to plant crops this year. Rather than just giving them food, the agency wants to give each farmer a 10 pound bag of seed. The bags are filled automatically by a machine. Suppose that the actual weight of a randomly chosen bag varies according to a normal distribution with a mean of 10.2 lbs and a standard deviation of .5 lbs.

1. What is the probability that a randomly chosen bag will be less than the 10 lbs that they hope to be giving each farmer?
2. What is the probability that a randomly chosen bag will actually weigh more than 10.5 lbs?
3. What is the probability that a randomly chosen bag will contain between 10 and 10.5 lbs?
4. Since the agency cannot really alter the machine that they are using, they want to relabel the bags such that only 5% of all bags would weigh less than the labeled value. What value should they use on the label?