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AP Statistics Special Problem 2

A company is considering implementing one of two quality control plans for monitoring the weights of automobile batteries that it manufactures. If the manufacturing process is working properly, the battery weights are approximately normally distributed with a specified mean and standard deviation.

Quality control plan A calls for rejecting a battery as defective if its weight falls more than 2 standard deviations below the specified mean.

Quality control plan B calls for rejecting a battery as defective if its weight falls more than 1.5 interquartile ranges below the lower quartile of the specified population.

Assume the manufacturing process is under control.

a. What proportion of batteries will be rejected by plan A ?

b. What is the probability that at least 1 of 2 randomly selected batteries will be rejected by plan A ?

c. What proportion of batteries will be rejected by plan B ?