Answer on Question #67664 – Math – Statistics and Probability

Question

The weight of potato chips in a large-size bag is stated to be 16 ounces. The amount that the packaging machine puts in these bags is believed to have a normal model with a mean of 16.3 ounces and a standard deviation of 0.19 ounces.

a) What fraction of all bags sold are underweight?

b) Some of the chips are sold in "bargain packs" of 3 bags. What's the probability that none of the 3 is underweight?

c) What's the probability that the mean weight of the 3 bags is below the stated amount?

d) What's the probability that the mean weight of a 24-bag case of potato chips is below 16 ounces?

Solution

a) $P(X < 16) = P\left(X < \frac{16-16.3}{0.19}\right) = P(Z < -1.58) = 0.0571.$

b) $P = \left(1 - P(X < 16)\right)^3 = (1 - 0.0571)^4 = 0.8383.$

c) $P(\bar{X} < 16) = P\left(X < \frac{16-16.3}{0.19/\sqrt{3}}\right) = P(Z < -2.73) = 0.0032.$

d) $P(\bar{X} < 16) = P\left(X < \frac{16-16.3}{0.19/\sqrt{24}}\right) = P(Z < -7.74) < 0.0001.$

Answer: a) 0.0571; **b)** 0.8383; **c)** 0.0032; **d)** 0.0001.