Answer on Question #67770 – Math – Statistics and Probability

Question

I bought two packets of apples, 25 in each packet. The mean and standard deviation of weights of apples in the first packet are 235 and 3; and the mean and standard deviation for the second packet are 237.5 and 4. Write down the mean and standard deviation formula for all the fifty apples and compute them.

Solution

The formulas for the mean and standard deviation of the total combined population of two populations:

$$\mu = \frac{\mu_1 n_1 + \mu_2 n_2}{n_1 + n_2} = \frac{235 * 25 + 237.5 * 25}{25 + 25} = 236.25;$$

$$\sigma = \sqrt{\frac{\sigma_1^2 n_1 + \sigma_2^2 n_2}{n_1 + n_2} + \frac{n_1 n_2}{(n_1 + n_2)^2}(\mu_1 - \mu_2)^2} = \sqrt{\frac{3^2 * 25 + 4^2 * 25}{25 + 25} + \frac{25 * 25}{50^2}(235 - 237.5)^2} \approx$$

$$\approx 3.75.$$

Answer: 236.25; 3.75.