

Answer on Question #73714 – Math – Statistics and Probability

Question

If a set of observations is normally distributed, what percentage of the observations differ from the mean by

- a. More than 1.3σ
- b. Less than 0.52σ

Solution

a.

$$P(X > \mu + 1.3\sigma) = P\left(Z > \frac{\mu + 1.3\sigma - \mu}{\sigma}\right) = P(Z > 1.3) = 1 - P(Z < 1.3)$$

From z-table:

$$P(Z < 1.3) = 0.9032$$

Thus,

$$P(X > \mu + 1.3\sigma) = 1 - 0.9032 = 0.0968.$$

Percentage of the observations that differ from the mean by more than 1.3σ is 9.68%.

b.

$$P(X < \mu - 0.52\sigma) = P\left(Z < \frac{\mu - 0.52\sigma - \mu}{\sigma}\right) = P(Z < -0.52)$$

From z-table:

$$P(Z < -0.52) = 0.3015$$

Thus,

$$P(X < \mu - 0.52\sigma) = 0.3015.$$

Percentage of the observations that differ from the mean by less than 0.52σ is 30.15%.

Answer: a. 9.68%; **b.** 30.15%.