
Use Of Appropriate Mathematical Methods Such As Arithmetic, Geometric Or Analytical Means To Solve Problems

Question 1

Canine Crunchies Inc. (CCI) sells large bags of dog food to warehouse clubs. CCI uses an automatic filling process to fill bags. Weights of the filled bags are approximately normally distributed with a mean of 50 kilograms and a standard deviation of 1.25 kilograms.

What is the probability that a filled bag will weigh less than 49.5 kilograms?

$$Z = (49.5 - 50) / 1.25 = -0.4$$

P (X

Therefore there is a 34.46 percent chance that a filled bag would weigh less than 49.5Kg

What is the probability that a that a sampled filled bag will weigh between 48.5 and 51kilograms

$$Z \text{ score for } 48.5 \text{ Kg} = (48.5 - 50) / 1.25 = -1.2$$

$$Z \text{ score for } 51\text{Kg} = (51-50) / 1.25 = 0.8$$

P (X

Therefore, there is a 67.3% chance that a randomly sampled a filled bag will weigh between 48.5 and 51 kilograms.

What is the minimum weight a bag of dog food could be and remain in the top 15% of all bags filled?

$$1 - 0.15 = .85$$

$$Z = 1.04$$

$$1.04 = (X - 50.0) / 1.25$$

X = 51.3kg therefore the bag must weigh a minimum of 51.3 kilograms.

d. CCI is unable to adjust the mean of the filling process. However, it is able to adjust the standard

deviation of the filling process. What would the standard deviation need to be so that no more than 2% of all filled bags weigh more than 52 kilograms?

$$1 - 0.02 = 0.98$$

$$Z = 2.06$$

$$SD = 2/2.06 = 0.9708 \text{Kg}$$

Question 2

The Baily Hill Bicycle Shop sells mountain bikes and offers a maintenance program. The manager has found the average repair bill during the maintenance program's first year to be \$15.30 with a standard deviation of \$7.00.

What is the probability a random sample of 40 customers will have a repair cost exceeding \$16.00?

$$P [16 - 15.30/7. 40)$$

$$1 - P(X > 16) = 0.265$$

Therefore the chance that a a random sample of 40 would have a repair cost of more than 16 is 0.265%

What is the probability the mean repair cost for a sample of 100 customers will be between \$15.10 and \$15.80?

$$P (15.1 - 15.3/7 100)$$

$$1 - p (Z$$

$$P(X$$

$$P(15.8 - 15.3/7. 100).$$

$$1 - p (Z$$