LEARNING AS ONE NATION

Expanded Project

Stat & Prob_Q3_9

S H S L E A R N I N G A C T I V I T Y

Name: _____ **Score/Mark:** _____

Grade and Section: _____ **Date:** _____

Strand: ☐ STEM ☐ ABM ☐ HUMSS ☐ ICT (*TVL Track*)

Subject: ***Statistics & Probability***

Type of Activity: ☐ Concept Notes ☐ Skills: Exercise/Drill ☐ Illustration ☐ Performance Task ☐ Essay/Report ☐ Others: _____

Activity Title: Characteristics of a Normal Distribution

Learning Target: To explain some characteristics of a normal probability distribution.

References: *(Author, Title, Pages)*
1) Walpole, R. E. et al. "Probability and Statistics for Engineers & Scientists, 8th Ed", pp. 172-185;
2) R.A. Rañoa and L.A. Sajulga, CVIF Learning Activities

Characteristics of Normal Distributions

1. A normal distribution is symmetric around its mean.
2. The mean, median, and mode of a normal distribution are equal.
3. In a normal curve, the center is denser compared to its tails.
4. They are asymptotic with respect to the horizontal axis as both tails approach the axis in the direction away from the mean (μ) (to the right and to the left).
5. The curve's shape is defined by the two parameters: mean (μ) and standard deviation (σ).
6. The total area under all normal curves and their horizontal axis is always equal to 1.
7. The area under a normal curve bounded by any two ordinates $x = x_1$ and $x = x_2$ is equal to the probability a normal random variable X assumes between $x = x_1$ and $x = x_2$ (as illustrated in Figure A).

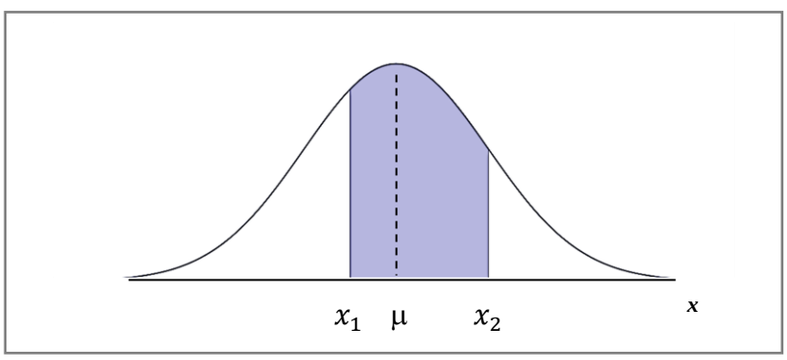

Figure A: $P(x_1 < x < x_2) = area\ of\ the\ shaded\ region$

Exercises:

1. Explain the meaning of the phrase, "symmetric around the mean".
2. Briefly comment on why a normal curve is asymptotic with the horizontal axis. (Hint: Look at the density function.)
3. Prove that the area under a normal curve is equal to 1. (Optional)