

Answer on Question #84193 – Math – Statistics and Probability

Which of the following statements are true and which are false? Justify. (10)

Question

- a) The area under the curve of a standard normal distribution between $-\infty$ and 0 is 0.45.

Solution

Properties of a Normal Curve

1. All Normal Curves have the same general bell shape.
2. The curve is symmetric with respect to a vertical line that passes through the peak of the curve.
3. The curve is centered at the mean μ which coincides with the median and the mode and is located at the point beneath the peak of the curve.
4. The area under the curve is always 1.
5. The curve is completely determined by the mean μ and the standard deviation σ . For the same mean, μ , a smaller value of σ gives a taller and narrower curve, whereas a larger value of σ gives a flatter curve.
6. The area under the curve to the right of the mean is 0.5 and the area under the curve to the left of the mean is 0.5.

The normal distribution with parameter values $\mu = 0$ and $\sigma = 1$ is called the standard normal distribution.

The area under the curve of a standard normal distribution between $-\infty$ and 0 is 0.5.

Answer: False.

Question

- b) If the probability of being left-handed is 0.1, the probability that none of the 3 persons selected randomly is left-handed is 0.729.

Solution

Probability of left-handed $p = 0.1$.

Probability of right-handed $1 - p = 1 - 0.1 = 0.9$.

The probability that none of the 3 persons selected randomly is left-handed is

$$Pr = (1 - p)^3 = 0.9^3 = 0.729$$

Answer: True.

Question

- c) If the correlation coefficient is zero, then the relationship between Y and X is positively linear.

Solution

The correlation coefficient is a measure that determines the degree to which two variables' movements are associated. The most common correlation coefficient, generated by the Pearson product-moment correlation, may be used to measure the linear relationship between two variables.

If the correlation coefficient of two variables is zero, it signifies that there is no linear relationship between the variables. However, this is only for a linear relationship; it is possible that the variables have a strong curvilinear relationship.

Answer: False.