

### STATISTICS Worksheet 3

1. b
2. c
3. a
4. a
5. c
6. b
7. b
8. d
9. a
10. Bayes' Theorem states that the conditional probability of an event, based on the occurrence of another event, is equal to the likelihood of the second event given the first event multiplied by the probability of the first event.

#### Formula for Bayes' Theorem

$$P(A|B) = \frac{P(A \cap B)}{P(B)} = \frac{P(A) \cdot P(B|A)}{P(B)}$$

where:

$P(A)$  = The probability of A occurring

$P(B)$  = The probability of B occurring

$P(A|B)$  = The probability of A given B

$P(B|A)$  = The probability of B given A

$P(A \cap B)$  = The probability of both A

11. A Z-score is a numerical measurement that describes a value's relationship to the mean of a group of values. Z-score is measured in terms of standard deviations from the mean

#### Example:

Suppose there are three students whose marks in their English examination are 12, 16 and 23. The mean is 17 and standard deviation is 4.55.

Now, z-score can be calculated as:

$$z = (\text{data point} - \text{mean}) / \text{standard deviation}$$

We've got the Z scores respectively for 12, 16 and 23 as -1.10, -0.22 and 1.32 respectively.

Let us consider the Z score of 23. It is 1.32, which means that 23 is 1.32 times the standard deviation away from its mean.

12. It is a parametric test which tells you how significant the differences between groups are. In other words, it lets you know if those differences (measured in means/averages) could have happened by chance. t-tests are called so, because the test results are all based on t-values. A t-test looks at the t-statistic, the t-distribution values, and the degrees of freedom to determine the probability of difference between two sets of data.

13. A percentile is a comparison score between a particular score and the scores of the rest of a group. It shows the percentage of scores that a particular score surpassed. For example, if you score 75 points on a test, and are ranked in the 85th percentile, it means that the score 75 is higher than 85% of the scores.
14. Analysis of variance (ANOVA) is an analysis tool used in statistics that splits an observed aggregate variability found inside a data set into two parts: systematic factors and random factors.
15. The one-way ANOVA can help you know whether or not there are significant differences between the means of your independent variables. When you understand how each independent variable's mean is different from the others, you can begin to understand which of them has a connection to your dependent variable (landing page clicks), and begin to learn what is driving that behavior.