

# Q-QUIZ NOVEMBER 2018 - ANSWERS



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**Decades and even centuries ago, great personalities laid the foundation of the products and services Q-DAS provides. Their ground-breaking ideas and achievements still shape our world today.**

1. Thomas Bayes formulated a specific case of the theorem that bears his name; this theorem provided a solution to a problem of inverse probability. Even though he published his essay in the 18th century, his theorem was only applied in various industries and research at the end of the 20th century.

The International Society for Bayesian Analysis was founded in 1992 to foster the application of his theories and methods in the industrial and scientific world.



2. Walter Andrew Shewhart had a strong influence on the application of statistical methods in operative quality management; he is most famous for his graphical method applied to control processes online.

He was an employee of the Bell Telephone Laboratories and focused on the application of statistical methods and procedures to gain corrective actions for manufacturing processes. His work had a high impact on SPC as Ford first implemented in their Q101 quality requirements.



3. To help his father calculate taxes, Blaise Pascal started some pioneering work on calculating machines. His mechanical calculator and thoughts behind it laid the foundation of modern computer science.



In 1653 he started to deal with probability calculus to solve gambling problems. Still today, we use Pascal's triangle, a triangular array of the binomial coefficients. Moreover, he invented the barometer to measure air pressure and laid the foundations for hydraulics, his contributions to physical sciences.

4. Ronald Aylmer Fisher was the one who provided us with statistical design of experiments (DoE) and the analysis of variance (ANOVA) – still today, both aspects are substantial parts of statistical process analysis.



Fisher's contributions to statistics include the introduction of the maximum likelihood estimation to estimate the parameters of a statistical model. This method attempts to find the parameter values that maximise the likelihood function, given the observations.

5. Before the Euro was introduced, Johann Carl Friedrich Gauss' portrait was featured on a German banknote. We owe him the normal distribution curve and the associated mathematical formula.



The normal distribution model has been used as a model to describe quality data for decades, not least because it facilitates a mathematical description. Still today, it is one of the few distribution types that can be used in manual evaluations.

6. At the tender age of 25, Siméon Denis Poisson became full professor in mathematics at the École Polytechnique in Paris. He developed several processes as a type of distribution that bears his name. His distribution type is of high practical relevance in quality management.



He published more than 300 essays providing the basis for probability theory, differential calculus and rational mechanics. We owe him the Poisson distribution to describe rare events in a high number of experiments. It is used to

describe e.g. the „number of defects per unit“ and the error log sheet.

7. Karl Pearson was the first to apply statistics to biology, especially to inheritance. He also established the scientific journal “Biometrika” and founded the Anglo-Saxon school of biometrics.

He published valuable essays on regression/correlation analysis and statistical significance tests. The Pearson system provides a model for any frequency distribution. Since real manufacturing processes affected by a broad variety of influences deviate from the ideal frequency curve, Pearson's system is a crucial tool to describe these processes realistically in a mathematical sense.



8. Jacob Bernoulli is known for his numerous contributions to calculus and was one of the founders of the calculus of variations. His most important contribution was the first version of the law of large numbers for statistical modelling. It is required to describe machines, production equipment, processes and measurement systems.

