

Mathematical modelling of a hyperboloid container essay sample

[Science](#), [Mathematics](#)



Mathematical model is a method of simulating real-life situations with mathematical equations to forecast their future behaviour. Eykhoff (1974) defined a mathematical model as ' a representation of the essential aspects of an existing system (or a system to be constructed) which presents knowledge of that system in usable form'. Mathematical models are used particularly in the natural sciences and engineering disciplines (such as physics, biology, and electrical engineering) but also in the social sciences (such as economics, sociology and political science); physicists, engineers, computer scientists, and economists use mathematical models most extensively. Mathematical modelling uses tools such as decision-theory, queuing theory, and linear programming, and requires large amounts of number crunching. Mathematical modelling approaches can be categorized into four broad approaches: Empirical models, simulation models, deterministic models, and stochastic models. The first three models can very much be integrated in teaching high school mathematics.

The last will need a little stretching. Empirical modelling involves examining data related to the problem with a view of formulating or constructing a mathematical relationship between the variables in the problem using the available data. However, simulation modelling involve the use of a computer program or some technological tool to generate a scenario based on a set of rules. These rules arise from an interpretation of how a certain process is supposed to evolve or progress. For deterministic modelling, it involves the use of equation or set of equations to model or predict the outcome of an event or the value of a quantity in general. Last but not least, stochastic modelling takes deterministic modelling one further step.

In stochastic models, randomness and probabilities of events happening are taken into account when the equations are formulated. The reason behind this is the fact that events take place with some probability rather than with certainty. This kind of modelling is very popular in business and marketing. We can use words, drawings or sketches, physical models, computer programs, or mathematical formulas. In other words, the modelling activity can be done in several languages, often simultaneously. A hyperboloid is a quadratic surface which may be one- or two-sheeted.