

Summary

HL Linear functions and regression

Subject	Year	Start date	Duration
Mathematics: applications and interpretation	IB1	Week 3, November	6 weeks

Course Part

Description

In this unit you will learn how to model linear models from bivariate data.

Inquiry & Purpose

? Inquiry / Higher Order Questions

Type	Inquiry Questions
Skills-based	Does correlation always imply causation?
Skills-based	When is it not appropriate to use a regression model?

Curriculum

⊕ Aims

Communicate mathematics clearly, concisely and confidently in a variety of contexts

◇ Objectives

Technology: Use technology accurately, appropriately and efficiently both to explore new ideas and to solve problems.

Inquiry approaches: Investigate unfamiliar situations, both abstract and from the real world, involving organizing and analyzing information, making conjectures, drawing conclusions, and testing their validity.

📖 Syllabus Content

Topic 2: Functions

SL Content

SL 2.1

Different forms of the equation of a straight line. Gradient; intercepts.

Lines with gradients m_1 and m_2

Parallel lines $m_1 = m_2$. Perpendicular lines $m_1 \times m_2 = -1$

Topic 4: Statistics and probability

SL Content

SL 4.4

Linear correlation of bivariate data.

Pearson's product-moment correlation coefficient, r .

Scatter diagrams; lines of best fit, by eye, passing through the mean point.

Equation of the regression line of y on x .

Use of the equation of the regression line for prediction purposes.

Interpret the meaning of the parameters, a and b , in a linear regression $y = ax + b$.

SL 4.10

Spearman's rank correlation coefficient, r_s .

Awareness of the appropriateness and limitations of Pearson's product moment correlation coefficient and Spearman's rank correlation coefficient, and the effect of outliers on each.

SL 4.11

Formulation of null and alternative hypotheses, H_0 and H_1

Significance levels. p -values.

The t -test.

AHL Content

AHL 4.13

Non-linear regression.

Evaluation of least squares regression curves using technology.

Sum of square residuals (SS_{res}) as a measure of fit for a model.

The coefficient of determination (R^2). Evaluation of R^2 using technology.

ATL Skills

 Approaches to Learning

 Thinking

 Communication



Developing IB Learners

☆ Learner Profile



Inquirers



Knowledgeable



Thinkers