

# Exam Topics

Preparatory Course  
Computer Science and Mathematics

## Variables and Control Statements

- Given a script: Describe what it does and which values its variables have at the end. This includes the variables' data type.
- Write a short script that accomplishes a simple task using *if* and *else*

## Loops and Lists

- Given a script: Describe what it does and which values its variables have at the end. This includes stating the number of iterations as well as entries in a list.
- Write a short script that manipulates each item in a list using a for loop.

## Functions

- Sketch a function plot by calculating a few points and connecting them
- Translate, stretch or mirror a given function by applying the appropriate formula.

## Linear Algebra

- Given some angles or side lengths, calculate other side lengths or other angles in a right triangle.
- Given two vectors, calculate the angle between them.
- Multiply a given vector by a scalar, add the result to another vector
- Multiply a given vector by a given matrix

## Derivatives

- Calculate the derivative of a function. Use multiplication, division or chain rule if applicable.
- Calculate the position of local extrema of a function given its derivative.

## Integration

- Calculate the area under a function curve in a given boundary. The anti-derivative will either be given or can be calculated using the reverse exponent rule.

### Allowed material:

Pen, pocket calculator and one DIN-A5 sheet with hand written notes (one sided)