The Emperors New Mind

The Turing Test

AI capabilities/limitations of Computers

Succesful passing of Turing test involves valid indication of thought, intelligence, understanding, consciousness

Can a computer mimic a human?

Algorithms and Turing Machines

Algorithms/Turing Machines/ Universal Turing Machines

Limitations of algorithms

Systematic Procedure – the flow of the algorithm

Subroutine – small section of a bigger algorithm

Turing Machines involves abstract mathematics

Is there some mechanical procedure which can solve all mathematical problems?

Church-Turing Thesis

Lambda Calculus v Turing Machine

The Turing Machine concept defines a mathematical procedure

Universal Turing Machines

Code the list of instructions of a Turing Machine into a strings of 1’s and 0’s

Lambda Calculus

Computability is an abstract mathematical concept

Universe of objects, each of which stands for some function

For a function f of two variables p and q we say: (fp) q the result of fp applied to q

For three variables ((fp) q) r

For a functions Lambda x.[fx] any occurrence of x in the square brackets which follows is a placeholder for substitution of anything that follows that expression

Lambda x.fx => a => Lambda x.fx a = fa => Lambda x.fx = f

Lambda f.f(fx) => g => (Lambda f.(fx))g => g(gx)

Hilbert Programme of Maths

Russells Paradox: A set is a member of itself