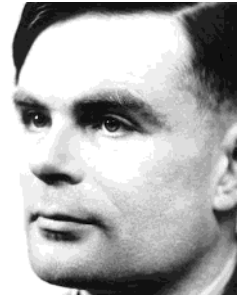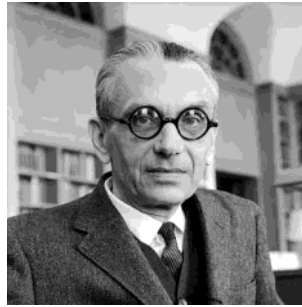* 300 BCE: Euclid ⎯⎡ GCD
                    ⎣ Elements

* Question: trisect an angle using ①
  compass and straightedge?

Question: doubling a cube
          (using straightedge & compass)
                                        ②

volume = 2

800's AD: Al-Khawrazmi:
          ⎡ algebra
          ⎣ arithmathic

1500's: cubic equation

1800's: Abel-Ruffini: degree five polynomials
        don't generally have a solution that
        can be represented by radicals...

dont j... U
can be represented by radicals...

1800's : Galois : $x^5 - x - 1 = 0$ has no
radical solutions.

↳ Piere Wantzel: ① and ② are impossible
Lp P

Newton's Principia Mathematica
↳ solving polynomial equations
approximately

Gauss: Disquisitions Arithmaticae
↳ FFT (ealier than Cooley/
Tukey)

1900

Hilbert } Formalist school:
Russell
Reduce math to formal
manipulation of symbols.

Kurt Gödel: incompleteness theorem:
no matter (how strong) a "system for
what
number theory you take", there are
statements that are "true" but you
cannot prove them.

┌─────────┐   ┌────────┐
│ true   │ ≫ │ proofs │
│statement│   └────────┘
└─────────┘

Models of computation:

Models of computation:

* Finite state machines
  (memoryless / finite memory)
* Finite state machines
  with unlimited stack memory

* Turing machines.

Languages:

* Regular Languages
* Context-free ~
* unrestricted ~
* ... - .