Huygens and Mathematics

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I. Huygens' Mathematical Drawings

A short tour

Rolling



Catenary



Curves: Tangents and Areas



Curves: The Paracentric Isochrone



Curves: A spiralling Isochrone



Curves: Solution of an "Inverse Tangent Problem"







II. Seeing through the Figures

- The Infinitely small: Infinitesimals and Limits
- Motion
- Processes: Modelling



Unrolling a Curve





The radius of Curvature



velocity

acceleration

time





velocity

acceleration

time







velocity

acceleration

time





velocity

acceleration

time





velocity :: resistance

Which curve?

Huygens: "Logarithmica"

 $[y = \ln x]$









1668

Comments

- The figure represents a process of motion
- All variables etc. visible in their mutual relations
- A geometrical **model**
- (Not a collection of equations)
- Geometrical Physics

Motion, resistance :: v ; Huygens' Model

Further results







VSper

Conclusion

- Huygens' Mathematics: Geometrical Analysis
- A phase in the development of Analysis
- Wiped out by the Calculus
- Yet: authentic mathematics, performed by a brilliant master
- As valuable and enjoyable as any modern mathematics.