The **ScienceMath-**project: **Arc Length**
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COMENIUS

Background

General didactic background

Background idea is an interdisciplinary approach with science. Students shall experience Mathematics as reasonable, significant and interesting by extra-mathematical references; learning in contexts shall contribute to an intuitive mathematic understanding. By means of scientific contexts and methods the often watched gap between formal math and authentic experience shall be closed on the one hand and versatility of mathematic terms or formulas shall be experienced on the other hand.

This teaching module is intended to be used as showing the applicability of the arc length formula in the real world. The use of it is confirmed by a physics approximation. The lesson is a kind of a “proof”; it shows the use of a mathematical formula and an approximation from physics.

Mathematical background

The central content of this teaching module is the well known formula $L = \int_a^b \sqrt{1 + [f'(x)]^2}\, dx$

for the length of a plane curve which is given by f(x) = y.

The further mathematical background is developed under *Teaching Material* – for direct use in school.

The idea of teaching implementation

The use of the formula of arc length is an example for the use and importance of mathematics in the real world. It should motivate students and lead them to a realistic and comprehensive understanding of mathematics.

Numerical calculation is easily done by using Excel or similar software. Using formula and numerical calculation will produce the same result. But finally it is also shown that the result is logically expected.

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