ScienceMath-projekt: **x^-0,5**
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Education and Culture
Lifelong learning programme
COMENIUS

Background

General didactic background

Plotting mathematical functions seems to be meaningless activity sometimes. However, one can easily find an example to show the applicability of linear function. The same is true for quadratic function as well as root function. But what about root function to power minus one? Young people need to see the correlation between mathematical theory and the real world. As a result, students will always prefer theory which is supported by examples from concrete uses. While difficult, it is possible to find a practical example of the square root function to minus one.

Mathematical background

A natural phenomenon is observed and the measured points are plotted in graph. The question is: what mathematical function fits the plotted points and therefore describes this phenomenon.

The idea of teaching implementation

We start using one of the computer applets
(http://www.hanksville.org/courseware/solarsystem/planets.html
http://galileoandeinstein.physics.virginia.edu/more_stuff/flashlets/innerplanets.htm
http://physik.uibk.ac.at/hephy/applets/physlet_resources/bu_physlets/c17_solar_sim.html)

which simulate the movement of inner solar system planets. The orbits are presented by cycles, although we know that planets path around Sun are ellipses. As the eccentricity of the ellipses is very close to 1, this approximation is justified. The central question is: what is the relationship between the speed of the planet and the radius of its orbit. We plot the measured values into speed-radius coordinate system and try to guess the appropriate function which ties the two variables.

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