Introducing Spacetime Geometry: Relativity on Rotated Graph Paper

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"Relativity on rotated graph paper" Am J Phys 84, 344 (May 2016)

geogebra.org/robphy





Why the hyperbola? Experimental evidence



Einstein's Principles of Relativity

- All inertial observers [traveling in a straight line with constant velocity-vector] are equivalent.
 <u>No experiment can detect the</u> <u>inertial observer's state of motion.</u>
- All observers measure the <u>same speed of light</u> (regardless of the state of motion of the source or the observer).

Light Clocks on a Spacetime Diagram



Alice's **light-clock** and light signals reflecting off her distant mirrors a length *d* away (in her frame)



Alice's light-**clock diamonds**

How do we draw Bob's Light Clock?



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Ordinary Graph Paper rotated can be used in a simple way to allow visual calculations in Special Relativity by counting "ticks".

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