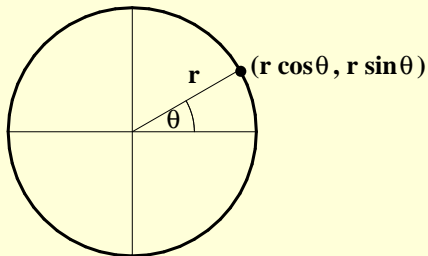
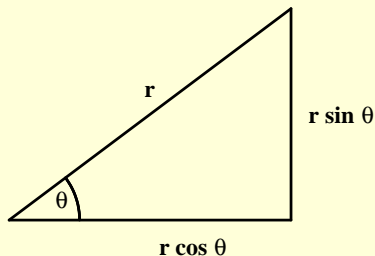


Circle Geometry



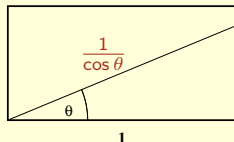
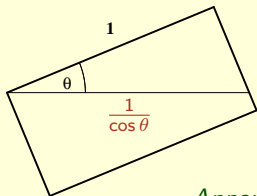
$$r\theta = \text{arclength}$$



If $\tan \theta = \frac{3}{4}$, what is $\cos \theta$?

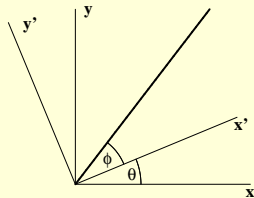
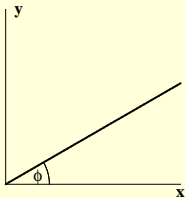
Measurements

Width:



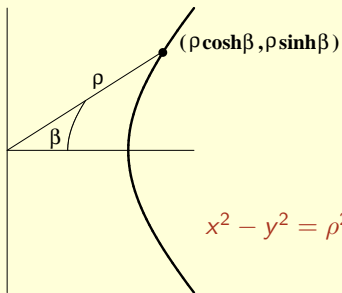
Apparent width > 1

Slope:



$$m = \tan(\theta + \phi) = \frac{\tan \theta + \tan \phi}{1 - \tan \theta \tan \phi} = \frac{m_1 + m_2}{1 - m_1 m_2}$$

Hyperbola Geometry



$$\rho\beta = \text{arclength}$$

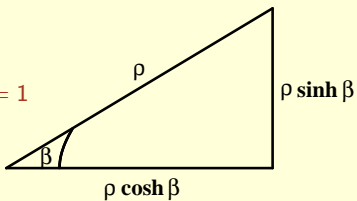
$$ds^2 = |dx^2 - dy^2|$$

$$\cosh \beta = \frac{1}{2} (e^\beta + e^{-\beta})$$

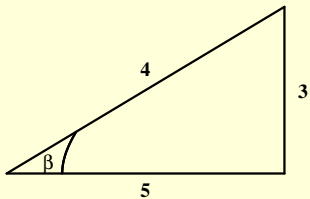
$$\sinh \beta = \frac{1}{2} (e^\beta - e^{-\beta})$$

Hyperbolic Triangle Trig

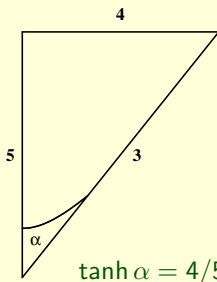
$$\cosh^2 \beta - \sinh^2 \beta = 1$$



Draw a 3–4–5 triangle in hyperbola geometry.

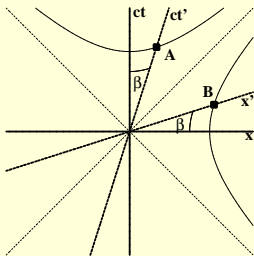


$$\tanh \beta = 3/5$$



$$\tanh \alpha = 4/5$$

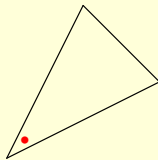
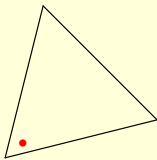
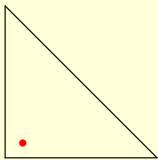
Special Relativity



$$x^2 - ct^2 = x'^2 - ct'^2$$

($c = 1$)

Draw a right triangle in hyperbola geometry.



“right angles” are not angles!