EXPONENTIAL AND LOGARITHMIC FUNCTIONS

$e^x = 0$

$e^x = \infty$

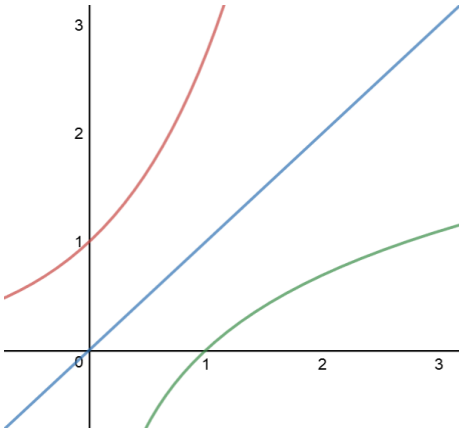
$ln\ ln\ x = -\infty$

$ln\ ln\ x = \infty$

$x = y \Leftrightarrow a^y = x$

$ln\ ln\ x = x$, where $ln\ ln\ e = 1$

$ln\ ln\ x = y \Leftrightarrow e^y =$



Cancellation Equations

$(a^x) = x$

$a^x = x$

$ln\ ln\ (e^x) = x$

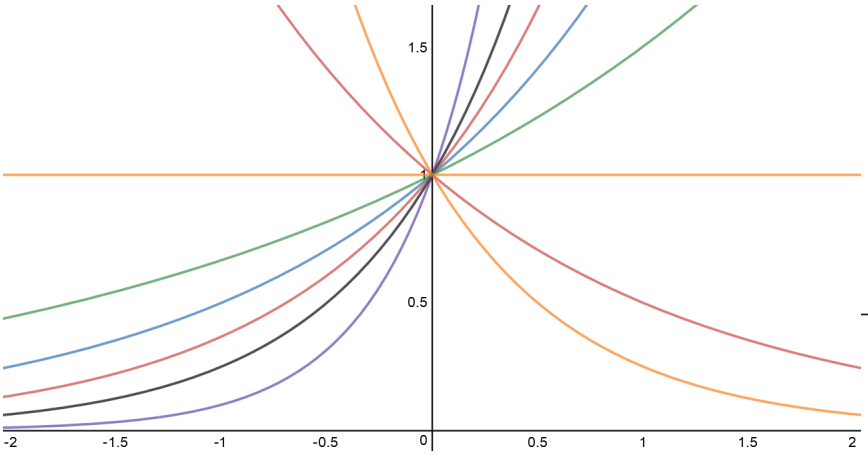
$e^{lnln\ x} = x$

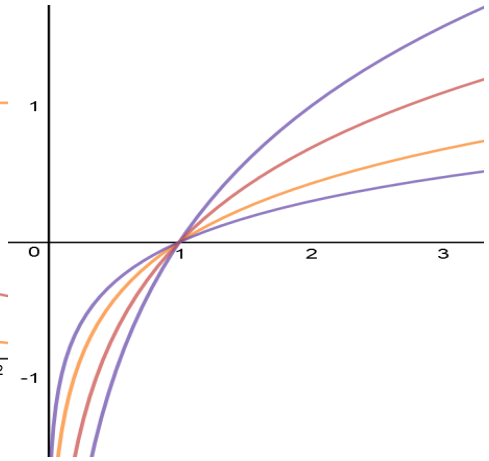
Laws of Logarithms

$(xy) = x + y$

$\left(\frac{x}{y}\right) = x - y$

$(x^r) = rx$





HYPERBOLIC FUNCTIONS

$sinh\ sinh\ x = \frac{e^x - e^{-x}}{2}$

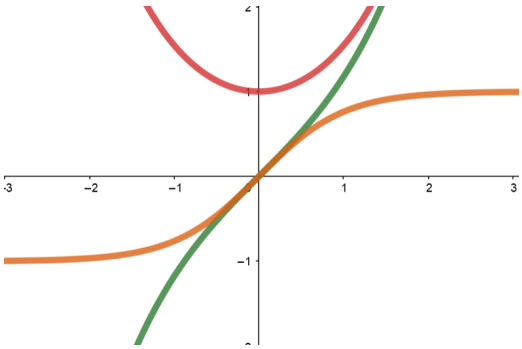
$x = \frac{1}{sinh\ sinh\ x}$

$cosh\ cosh\ x = \frac{e^x + e^{-x}}{2}$

$x = \frac{1}{cosh\ cosh\ x}$

$tanh\ tanh\ x = \frac{sinh\ sinh\ x}{cosh\ cosh\ x}$

$coth\ coth\ x = \frac{1}{tanh\ tanh\ x}$



INVERSE HYPERBOLIC FUNCTIONS

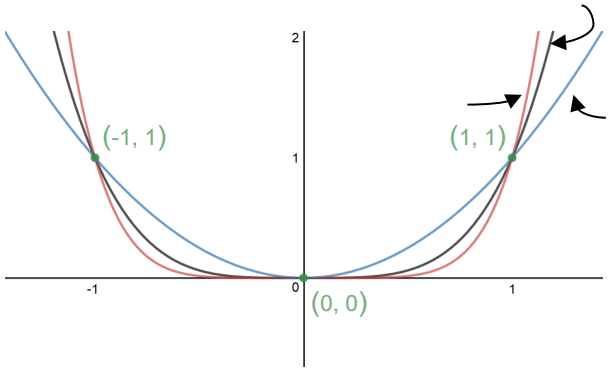
$y = x \quad \Leftrightarrow \; sinh\, sinh\, y = x \qquad x = ln\, ln \left(x + \sqrt{x^2 + 1}\right)$

$y = x \quad \Leftrightarrow \; cosh\, cosh\, y = x \; and \; y \geq 0 \qquad x = ln\, ln \left(x + \sqrt{x^2 + 1}\right)$

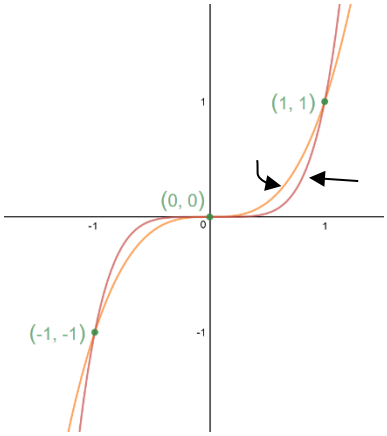
$y = x \quad \Leftrightarrow \; tanh\, tanh\, y = x \qquad x = ln\, ln \left(\frac{1 + x}{1 - x}\right)$

POWER FUNCTIONS $f(x) = x^n$

i. $f(x) = x^n,$ *where n is a positive integer*

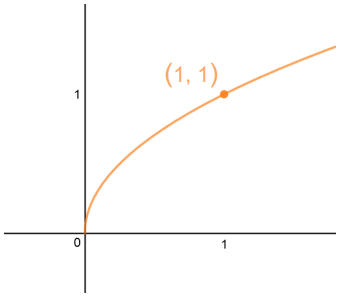


n is even

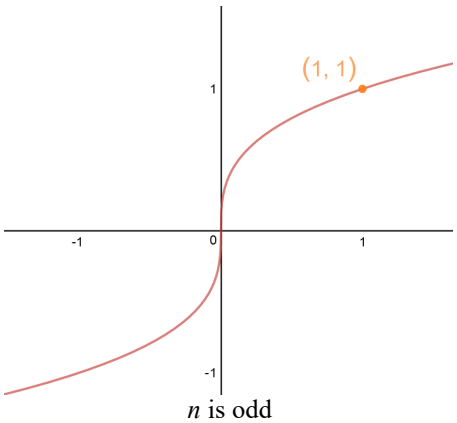


n is odd

ii. $f(x) = x^{\frac{1}{n}} = \sqrt[n]{x},$ *where n is a positive integer*

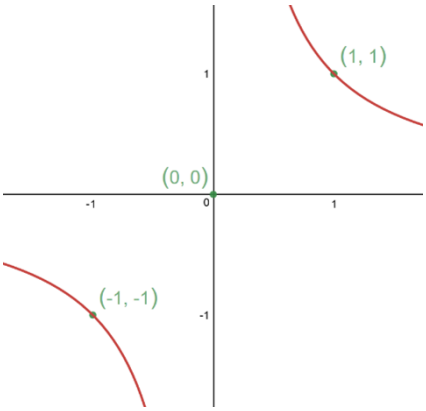


n is even



n is odd

iii. $f(x) = x^{-1} = \frac{1}{x}$



INVERSE TRIGONOMETRIC FUNCTIONS

$x = y \Leftrightarrow sin\ sin\ y = x$ *and*

$x = y \Leftrightarrow cos\ cos\ y = x$ *and*

$x = y \Leftrightarrow tan\ tan\ y = x$ *and*