**Harold’s Hyperbolics**

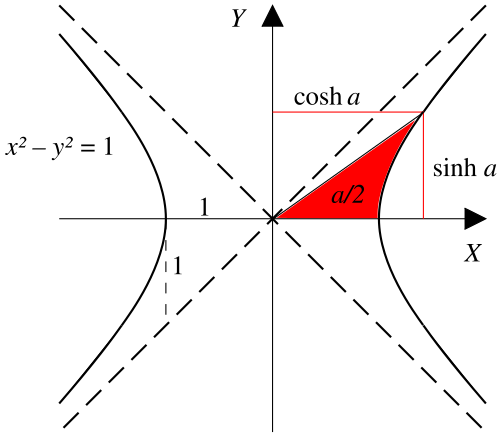
**Cheat Sheet**

22 September 2025

|  |
| --- |
| **Hyperbolic Graphs** |
| Hyperbolic Trigonometric Functions | Brilliant Math & Science Wiki |
| **Inverse Hyperbolic Graphs** |
|  |

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Hyperbolic Definitions** | |  |  |  | **Complex** |
| **1. Hyperbolic Sine** | |  |  |  |  |
| **2. Hyperbolic Cosine (catenary)** | |  |  |  |  |
| **3. Hyperbolic Tangent** | |  |  |  |  |
| **4. Hyperbolic Cotangent** | |  |  |  |  |
| **5. Hyperbolic Secant** | |  |  |  |  |
| **6. Hyperbolic Cosecant** | |  |  |  |  |
| **7. Inverse Hyperbolic Sine** | |  |  | | |
| **8. Inverse Hyperbolic Cosine** | |  |  | | |
| **9. Inverse Hyperbolic Tangent** | |  |  | | |
| **10. Inverse Hyperbolic Cotangent** | |  |  | | |
| **11. Inverse Hyperbolic Secant** | |  |  | | |
| **12. Inverse Hyperbolic Cosecant** | |  |  | | |
| **Catenary** |  | | This figure is a graph. It is of the function f(x)=2cosh(x/2). The curve decreases in the second quadrant to the y-axis. It intersects the y-axis at y=2. Then the curve becomes increasing. | | |

|  |  |
| --- | --- |
| **Hyperbolic Identities** |  |
| **Odd and Even** |  |
|  |
|  |
| **Pythagorean Identities** | *(Euler’s formula)* |
|  |
|  |
| **Sums/Difference of Angles** |  |
|  |
|  |
| **Double Angle** |  |
|  |
|  |
| **Half Angle** |  |
|  |
|  |
| **Squared** |  |
|  |
| **Exponents (Powers)** |  |
| **Natural Exponential** |  |
|  |
| **Natural Logarithmic** |  |



|  |  |
| --- | --- |
| **Hyperbolic Derivatives** |  |
| **1. Hyperbolic Sine** |  |
| **2. Hyperbolic Cosine** |  |
| **3. Hyperbolic Tangent** |  |
| **4. Hyperbolic Cotangent** |  |
| **5. Hyperbolic Secant** |  |
| **6. Hyperbolic Cosecant** |  |
| **7. Hyperbolic Arcsine** |  |
| **8. Hyperbolic Arccosine** |  |
| **9. Hyperbolic Arctangent** |  |
| **10. Hyperbolic Arccotangent** |  |
| **11. Hyperbolic Arcsecant** |  |
| **12. Hyperbolic Arccosecant** |  |

|  |  |
| --- | --- |
| **Hyperbolic 2nd Derivatives** |  |
| **1. Hyperbolic Sine** |  |
| **2. Hyperbolic Cosine** |  |

|  |  |
| --- | --- |
| **Hyperbolic Integrals** | (*See: Wikipedia,*[*list of integrals of hyperbolic functions*](https://en.wikipedia.org/wiki/List_of_integrals_of_hyperbolic_functions)*.*) |
| **1. Hyperbolic Sine** |  |
| **2. Hyperbolic Cosine** |  |
| **3. Hyperbolic Tangent** |  |
| **4. Hyperbolic Cotangent** |  |
| **5. Hyperbolic Secant** |  |
| **6. Hyperbolic Cosecant** |  |
| **7. Hyperbolic Secant2** |  |
| **8. Hyperbolic Cosecant2** |  |
| **9. Hyperbolic Arcsine** |  |
| **10. Hyperbolic Arccosine** |  |
| **11. Hyperbolic Arctangent** |  |
| **12. Hyperbolic Arccotangent** |  |
| **13. Hyperbolic Arcsecant** |  |
| **14. Hyperbolic Arccosecant** |  |
| **9. Hyperbolic Arcsine** |  |
| **10. Hyperbolic Arccosine** |  |
| **11. Hyperbolic Arctangent** |  |
| **12. Hyperbolic Arccotangent** |  |
| **13. Hyperbolic Arcsecant** |  |
| **14. Hyperbolic Arccosecant** |  |

**Sources**

* Wikipedia (2025). Hyperbolic Functions. <https://en.wikipedia.org/wiki/Hyperbolic_functions>.

**See Also**

* [Harold’s Trigonometry & Hyperbolic Parent Functions Cheat Sheet](https://www.toomey.org/tutor/harolds_cheat_sheets/Harolds_Parent_Functions_Trig_Cheat_Sheet.pdf)