**Harold’s**

**Trigonometry and Hyperbolic Parent Functions**

**Cheat Sheet**

AKA Library of Functions

15 September 2025

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| Exact Trig Values |
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| Hyperbolic Trigonometric Functions | Brilliant Math & Science Wiki |

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| **Trigonometry** |
| **Sine** |  | https://encrypted-tbn2.google.com/images?q=tbn:ANd9GcS59mgvINMaLHQP_n6aBU7KCWCmfX28XZe-isPA8Wz2FAErtgvi | Domain: (∞, ∞) with T = 2π/|b|Range: [1, 1]Inverse Function: Restrictions: NoneOdd/Even: OddGeneral Form:  |
| **Cosine** |  | https://encrypted-tbn0.google.com/images?q=tbn:ANd9GcTvW1VjiQQ_UHPBC7jeckN7puS4LQrJmZoF5LkYeq7Yj7S3_TtG | Domain: (∞, ∞) with T = 2π/|b|Range: [1, 1]Inverse Function: Restrictions: NoneOdd/Even: EvenGeneral Form:  |
| **Tangent** |  | https://encrypted-tbn1.google.com/images?q=tbn:ANd9GcQGpcj4cHM6jdEtlClniUWqaMiuxhwh6GllnQAVFm8cvuirt21w | Domain: (∞, ∞) except for Range: (∞, ∞)Inverse Function: Restrictions: Asymptotes at Odd/Even: OddGeneral Form:  |
| **Cosecant** |  | http://www.regentsprep.org/Regents/math/algtrig/ATT7/otherg2.gif | Domain: (∞, ∞) except for Range: (∞, -1] [1, ∞)Inverse Function: Restrictions: Range is boundedOdd/Even: OddGeneral Form:  |
| **Secant** |  | http://www.regentsprep.org/Regents/math/algtrig/ATT7/otherg7.gif | Domain: (∞, ∞) except for Range: (∞,1] [1, ∞)Inverse Function: Restrictions: Range is boundedOdd/Even: EvenGeneral Form:  |
| **Cotangent** |  | http://www.regentsprep.org/Regents/math/algtrig/ATT7/otherg94.gif | Domain: (∞, ∞) except for Range: (∞, ∞)Inverse Function: Restrictions: Asymptotes at x = Odd/Even: OddGeneral Form:  |
| **Arcsine** |  | http://www.phengkimving.com/calc_of_one_real_var/06_the_trig_func_and_their_inv/06_02_the_inv_trig_func/06_02_01_the_inv_trig_func_files/image028.gif | Domain: [1, 1] Range: or Quadrants I & IVInverse Function: Restrictions: Range & Domain are boundedOdd/Even: OddGeneral Form:  |
| **Arccosine** |  | http://www.phengkimving.com/calc_of_one_real_var/06_the_trig_func_and_their_inv/06_02_the_inv_trig_func/06_02_01_the_inv_trig_func_files/image046.gif | Domain: [1, 1] Range: or Quadrants I & IIInverse Function: Restrictions: Range & Domain are boundedOdd/Even: NoneGeneral Form:  |
| **Arctangent** |  | http://www.phengkimving.com/calc_of_one_real_var/06_the_trig_func_and_their_inv/06_02_the_inv_trig_func/06_02_01_the_inv_trig_func_files/image063.gif | Domain: (∞, ∞)Range: or Quadrants I & IVInverse Function: Restrictions: Range is boundedOdd/Even: OddGeneral Form:  |
| **Arccosecant** |  | http://www.phengkimving.com/calc_of_one_real_var/06_the_trig_func_and_their_inv/06_02_the_inv_trig_func/06_02_01_the_inv_trig_func_files/image117.gif | Domain: (∞,1] [1, ∞)Range: or Quadrants I & IVInverse Function: Restrictions: Range & Domain are boundedOdd/Even: OddGeneral Form:  |
| **Arcsecant** |  | http://www.phengkimving.com/calc_of_one_real_var/06_the_trig_func_and_their_inv/06_02_the_inv_trig_func/06_02_01_the_inv_trig_func_files/image099.gif | Domain: (∞,1] [1, ∞)Range: ( or Quadrants I & IIInverse Function: Restrictions: Range & Domain are boundedOdd/Even: NeitherGeneral Form:  |
| **Arccotangent** |  | http://www.phengkimving.com/calc_of_one_real_var/06_the_trig_func_and_their_inv/06_02_the_inv_trig_func/06_02_01_the_inv_trig_func_files/image081.gif | Domain: (∞, ∞)Range: or Quadrants I & IIInverse Function: Restrictions: Range is boundedOdd/Even: NeitherGeneral Form:  |
| **Hyperbolics** |
| **Hyperbolic Sine** |  | http://www.efunda.com/math/hyperbolic/images/sinh_plot.gif | Domain: (∞, ∞)Range: (∞, ∞)Inverse Function: Restrictions: NoneOdd/Even: OddGeneral Form:  |
| **Hyperbolic Cosine** |  | http://www.efunda.com/math/hyperbolic/images/cosh_plot.gif | Domain: (∞, ∞)Range: [1, ∞)Inverse Function: Restrictions: NoneOdd/Even: EvenGeneral Form:  |
| **Hyperbolic Tangent** |  | http://mathworld.wolfram.com/images/interactive/TanhReal.gif | Domain: (∞, ∞)Range: (1, 1)Inverse Function: Restrictions: Asymptotes at Odd/Even: OddGeneral Form:  |
| **Hyperbolic Cosecant** |  | http://www.efunda.com/math/hyperbolic/images/csch_plot.gif | Domain: (∞, 0) (0, ∞)Range: (∞, 0] [0, ∞)Inverse Function: Restrictions: Asymptotes at Odd/Even: OddGeneral Form:  |
| **Hyperbolic Secant** |  | http://mathworld.wolfram.com/images/interactive/SechReal.gif | Domain: (∞, ∞)Range: (0, 1]Inverse Function: Restrictions: Asymptote at Odd/Even: EvenGeneral Form:  |
| **Hyperbolic Cotangent** |  | http://www.efunda.com/math/hyperbolic/images/coth_plot.gif | Domain: (∞, 0) (0, ∞)Range: (∞, 1) (1, ∞)Inverse Function: Restrictions: Asymptotes at Odd/Even: OddGeneral Form:  |
| **Hyperbolic Arcsine** |  | http://www.efunda.com/math/hyperbolic/images/arcsinh_plot.gif | Domain: (∞, ∞)Range: (∞, ∞)Inverse Function: Restrictions: NoneOdd/Even: OddGeneral Form:  |
| **Hyperbolic Arccosine** |  | http://www.efunda.com/math/hyperbolic/images/arccosh_plot.gif | Domain: [1, ∞)Range: [0, ∞)Inverse Function: Restrictions: Odd/Even: NeitherGeneral Form:  |
| **Hyperbolic Arctangent** |  | http://www.efunda.com/math/hyperbolic/images/arctanh_plot.gif | Domain: (1, 1)Range: (∞, ∞)Inverse Function: Restrictions: Asymptotes at Odd/Even: OddGeneral Form:  |
| **Hyperbolic Arccosecant** |  | http://www.efunda.com/math/hyperbolic/images/arccsch_plot.gif | Domain: (∞, 0) (0, ∞)Range: (∞, 0] [0, ∞)Inverse Function: Restrictions: Asymptotes at Odd/Even: OddGeneral Form:  |
| **Hyperbolic Arcsecant** |  | http://www.efunda.com/math/hyperbolic/images/arcsech_plot.gif | Domain: (0, 1]Range: [0, ∞)Inverse Function: Restrictions: Odd/Even: NeitherGeneral Form:  |
| **Hyperbolic Arccotangent** |  | http://www.efunda.com/math/hyperbolic/images/arccoth_plot.gif | Domain: Range: Inverse Function: Restrictions: Asymptotes at Odd/Even: OddGeneral Form:  |

**Graphing Tips**

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| **The Six Trig “Levers”** | ***y = a sin (b (x - h)) + k*** | **Graphing Tips** | **Notes** |
| 1. Move up/down ↕
 | k (Vertical translation) |  | If then x-axis is replaced by -axis |
| 1. Move left/right ↔
 | h (Phase shift) | ‘+‘ shifts right |  |
| 1. Stretch up/down ↕
 | a (Amplitude) |  | a is NOT peak-to-peak on y-axis |
| 1. Stretch left/right ↔
 | b (Frequency 2) |  | T = peak-to-peak on -axis for  |
| 1. Flip about y-axis ⭯
 | b → b |  →  | Even Function:  |
| 1. Flip about x-axis ⭮
 | a → a |  →  | Odd Function:  |

**See Also:**

* [Harold’s Algebraic, Transcendental, and Conic Parent Functions Cheat Sheet](https://www.toomey.org/tutor/harolds_cheat_sheets/Harolds_Parent_Functions_Algebraic_Conics_Cheat_Sheet.pdf)
* [Harold’s Trigonometry & Hyperbolic Parent Functions Cheat Sheet](https://www.toomey.org/tutor/harolds_cheat_sheets/Harolds_Parent_Functions_Trig_Cheat_Sheet.pdf)
* [Harold’s Polar Parent Functions Cheat Sheet](https://www.toomey.org/tutor/harolds_cheat_sheets/Harolds_Parent_Functions_Polar_Cheat_Sheet.pdf)