Inverse cotangent in complex plane

Here we present the inverse cotangent in the complex plane on 2D and 3D graphs.

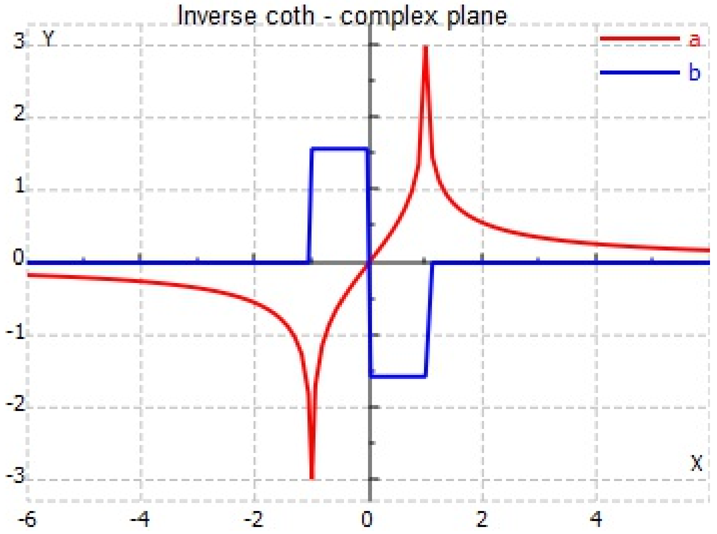
First we will draw the 2D graph, the real part and imaginary part will be two separated plots presented on the same graph. Argument x will take the values at a interval of [-6 , 6] with two hundred samples.

a := complexcurve2dre(arcoth(x) , x , -6 , 6 , 200)

Extract the real part of the complex values and prepare them for plotting

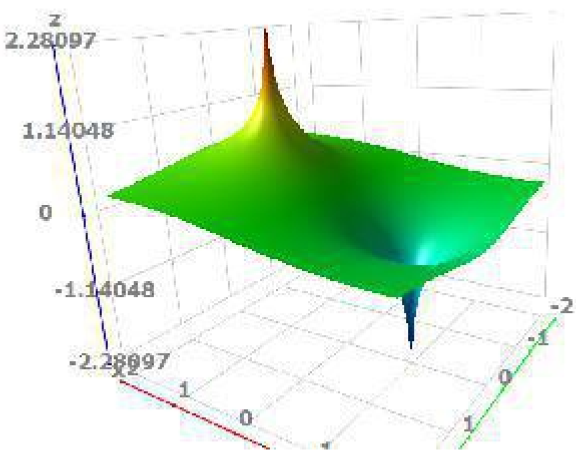
b := complexcurve2dimg(arcoth(x) , x , -6 , 6 , 200)

Extract the imaginary part of the complex values and prepare them for plotting



Now, we present the inverse cotangent complex plane values on a 3D graph.

c := surface3d(Re(arcoth(x + 1i · y)) , x , -2 , 2 , 100 , y , -2 , 2 , 100)

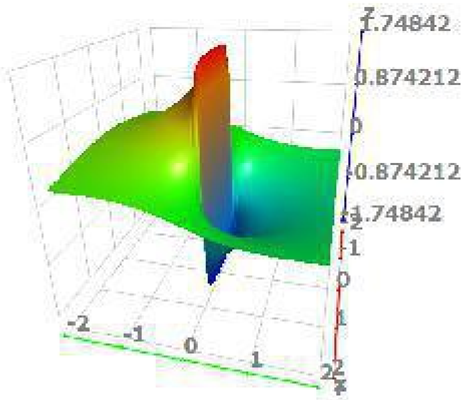


Real part of arccoth(z) over the complex z-plane

x-axis is at a interval of [-2 , 2] with 100 samples

y-axis is at a interval of [-2 , 2] with 100 samples

$$d := \text{surface3d}\left(\text{Im}\left(\text{arcoth}(x + 1i \cdot y)\right), x, -2, 2, 100, y, -2, 2, 100\right)$$



Imaginary part of arccoth(z) over the complex z-plane

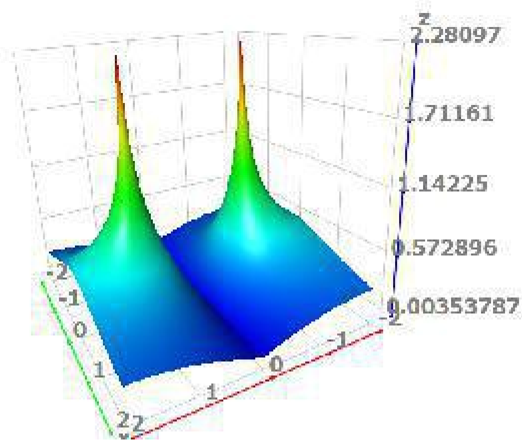
x-axis is at a interval of [-2 , 2] with 100 samples

y-axis is at a interval of [-2 , 2] with 100 samples

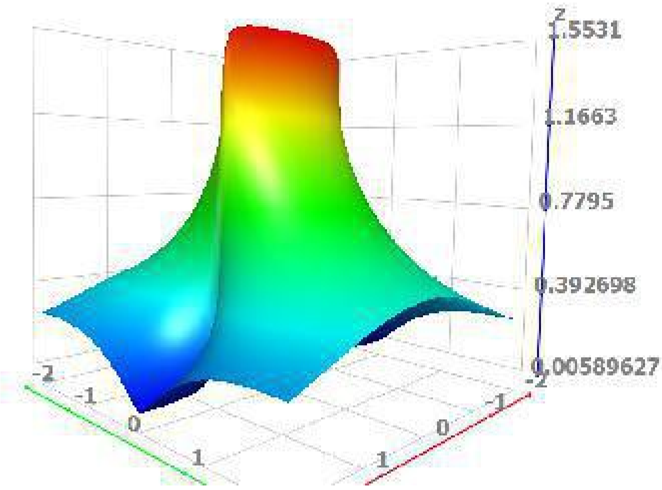
On the next two 3D-graphs we draw the absolute value of both the real and imaginary parts respectively.

$$e := \text{surface3d}\left(\left|\text{Re}\left(\text{arcoth}(x + 1i \cdot y)\right)\right|, x, -2, 2, 100, y, -2, 2, 100\right)$$

$$f := \text{surface3d}\left(\left|\text{Im}\left(\text{arcoth}(x + 1i \cdot y)\right)\right|, x, -2, 2, 100, y, -2, 2, 100\right)$$



Absolute value of the real part of arccoth(z) over the complex z-plane



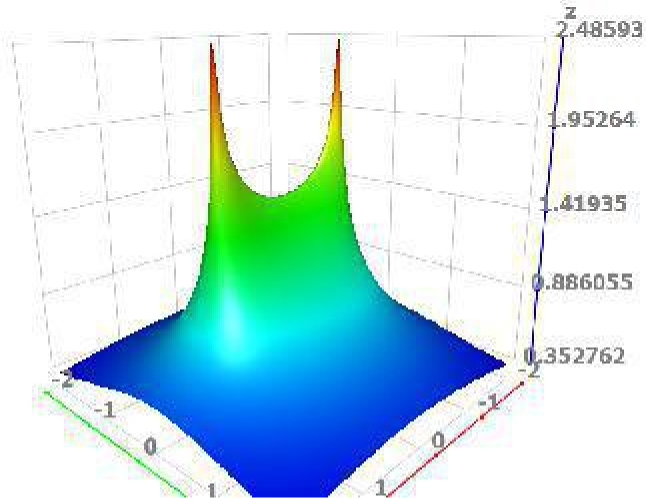
Absolute value of the imaginary part of arccoth(z) over the complex z-plane

x-axis is at a interval of [-2 , 2] with 100 samples

y-axis is at a interval of [-2 , 2] with 100 samples

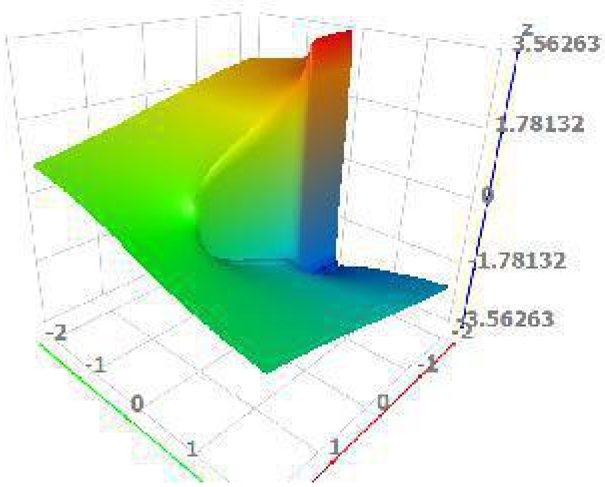
On the final graphs we draw the absolute value and the argument of the inverse cotangent hyperbolic function within the complex plane.

$$gr := \text{surface3d}\left(\left|\text{arccoth}(x + 1i \cdot y)\right|, x, -2, 2, 100, y, -2, 2, 100\right)$$



Absolute value of arccoth(z) over the complex z-plane

$$h := \text{surface3d}\left(\Theta\left(\text{arccoth}(x + 1i \cdot y)\right), x, -2, 2, 100, y, -2, 2, 100\right)$$



Argument of arccoth(z) over the complex z-plane