

## **Summary of Results: Graph of Riem. Zeta(s) Fct. with $\text{Im}(s)=0$**

As a summary and final result of the work done in the Jupyter Notebook

*"RiemannZetaFct\_and\_RiemannHypothesis.ipynb"*

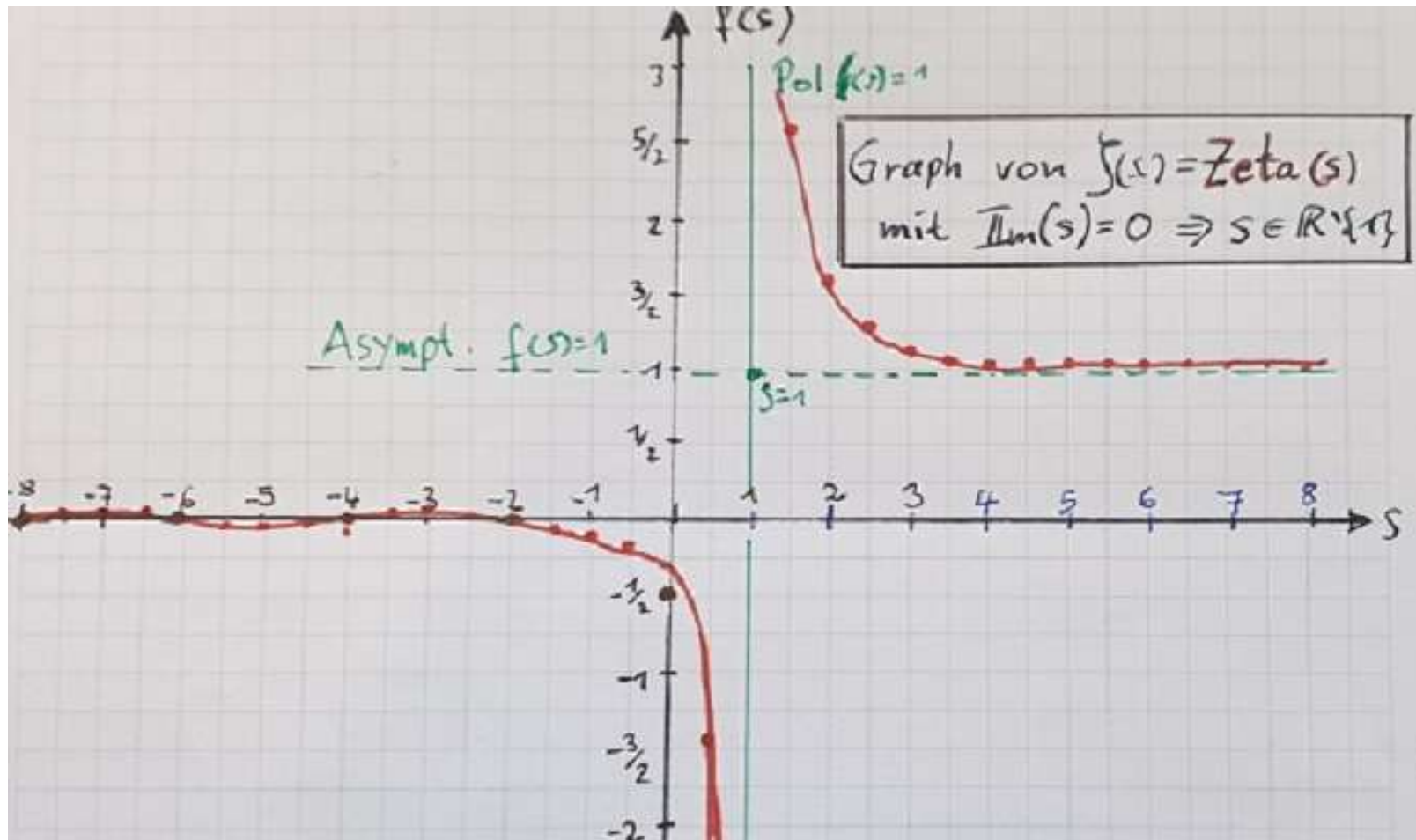
(see <https://github.com/HVoellinger/Mathematics>) we show the graph of  $\zeta(s)$  where  $\text{Im}(s)=0$ , s.t.  $s=\text{real number}$  (without  $s=1$ ).

We use the calculated values of  $\zeta(s)$  for this special  $s$  and summaries them in a small table (see below). we see a pole of  $\zeta(s)$  at  $s=1$  and an asymptote at  $f(s)=1$  for  $s>1$ . Compare also the remarks about the  $\lim(\zeta(s))$  for  $s$  goes to positive infinity:  $\lim(s \rightarrow +\infty)(\zeta(s))=1$ .

# Values of Zeta(s) with Im(s)=0

s	Zetas(s)	Remark
-8	$\zeta(-8) = 1.3859169880942308e-05$	0
-7,5	$\zeta(-15/2) = 0.003274799574186712$	
-7	$\zeta(-7) = 0.004167422013553654$	
-6,5	$\zeta(-13/2) = 0.0027469095530168607$	
-6	$\zeta(-6) = 2.8347851868673592e-08$	0
-5,5	$\zeta(-11/2) = -0.0026714542649568995$	
-5	$\zeta(-5) = -0.003968252590985674$	
-4,5	$\zeta(-9/2) = -0.003091668796611392$	
-4	$\zeta(-4) = 6.429216196053237e-11$	0
-3,5	$\zeta(-7/2) = 0.004441011354616652$	
-3	$\zeta(-3) = 0.008333333335927267$	
-2,5	$\zeta(-5/2) = 0.008516928778669624$	
-2	$\zeta(-2) = 1.5603186562147366e-13$	0
-1,5	$\zeta(-3/2) = -0.025485201889790032$	
-1	$\zeta(-1) = -0.0833333333332381$	-1/12
-0,5	$\zeta(-1/2) = -0.2078862249773517$	
0	$\zeta(0) = -0.49999999999999906$	-1/2
0,5	$\zeta(1/2) = -1.460354508809586$	
1	infinity	Pol
1,5	$\zeta(3/2) = 2.612375348685488$	
2	$\zeta(2) = 1.6449340668482266$	$\pi^2/6$
2,5	$\zeta(5/2) = 1.341487257250917$	
3	$\zeta(3) = 1.2020569031595942$	
3,5	$\zeta(7/2) = 1.1267338673170566$	
4	$\zeta(4) = 1.0823232337111381$	$(\pi^2)^2/90$
4,5	$\zeta(9/2) = 1.0547075107614543$	
5	$\zeta(5) = 1.03692775514337$	
5,5	$\zeta(11/2) = 1.0252045799546856$	
6	$\zeta(6) = 1.0173430619844488$	$(\pi^2)^3/945$
6,5	$\zeta(13/2) = 1.0120058998885244$	
7	$\zeta(7) = 1.0083492773819225$	
7,5	$\zeta(15/2) = 1.0058267275365227$	
8	$\zeta(8) = 1.0040773561979444$	$((\pi^2)^2)^2/9450$

Graph of the Riem. Zeta Fct.  $\zeta(s)$  with  $\text{Im}(s)=0$



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-0,5	$\zeta(-1/2) = -0.2078862249773517$	
0	$\zeta(0) = -0.4999999999999906$	-1/2
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Graph of the Riem. Zeta Fct. Zeta(s) with Im(s)=0

