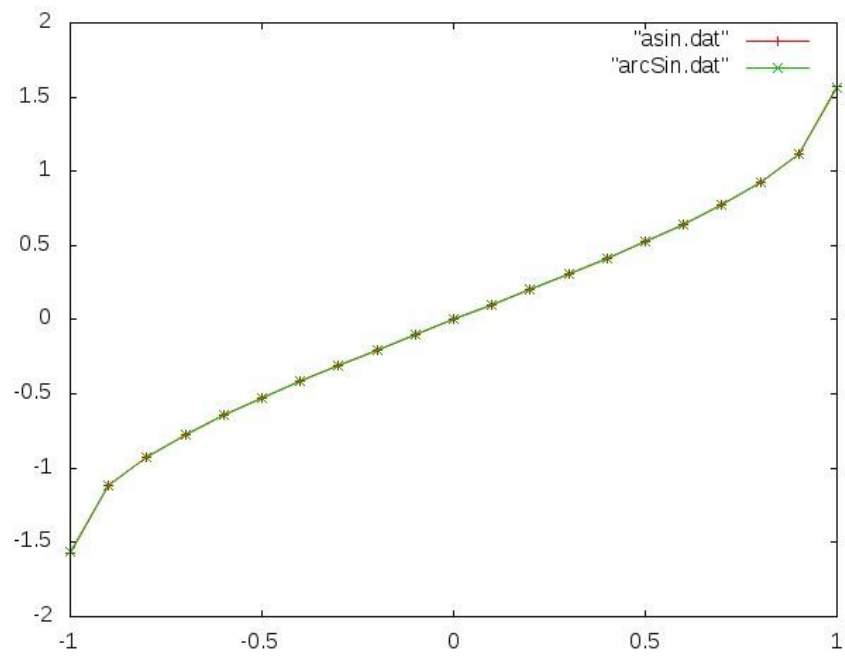
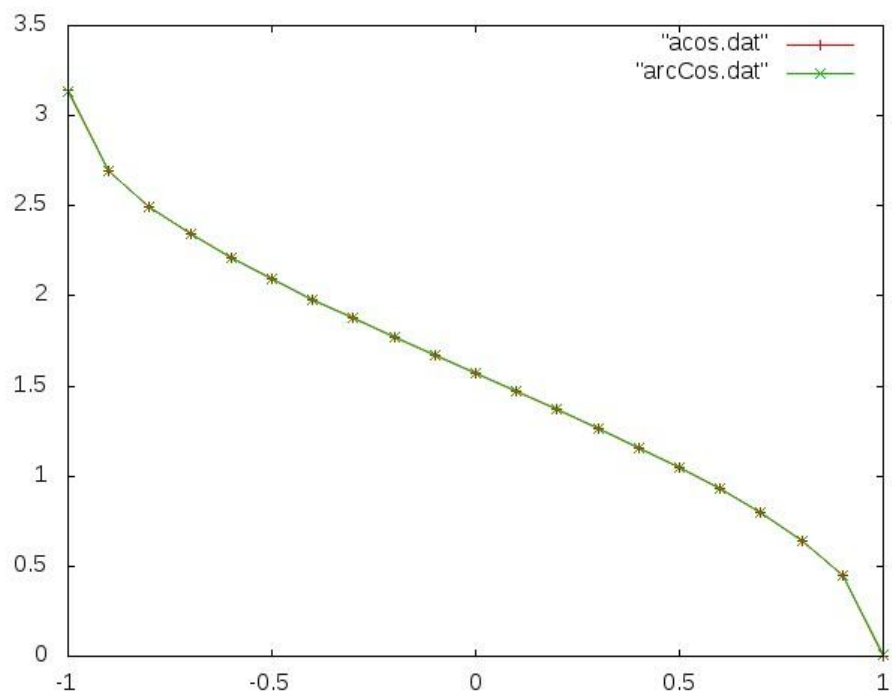


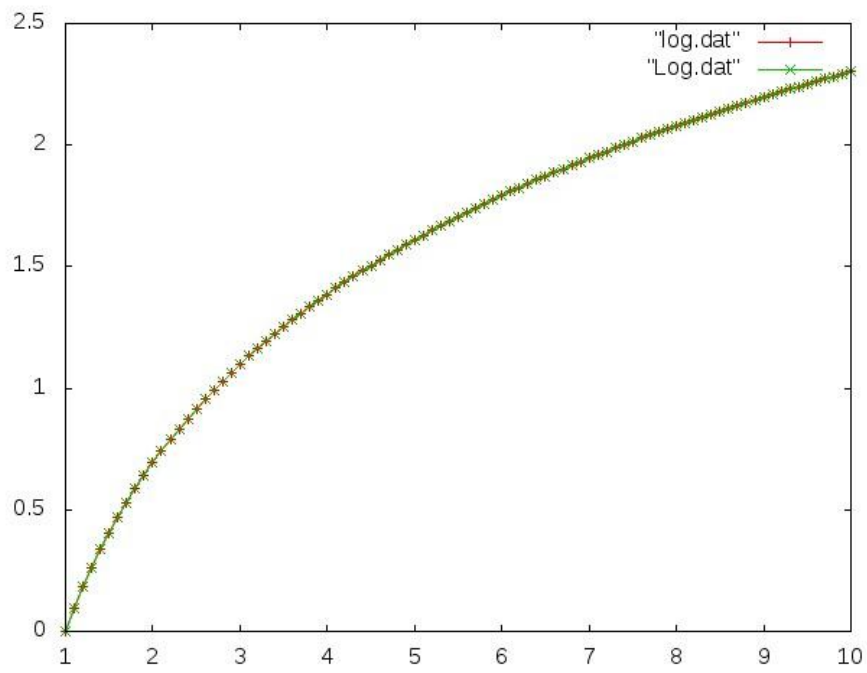
arcSin:



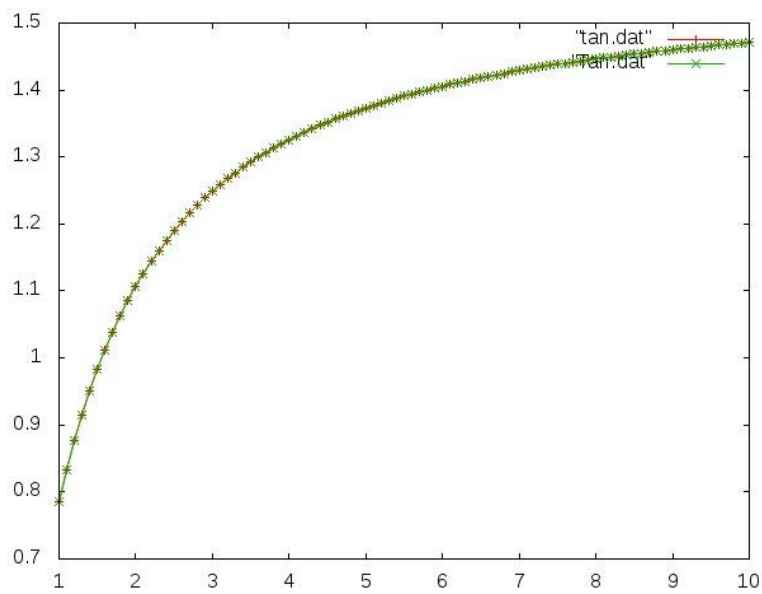
ArcCos:



Arctan:



Log:



```

antonio@danio-VirtualBox:~/rzhong6/asn25_2/mathlib-test -a
x      arcsin      Library      Difference
-      -      -      -
-1.0000      -1.56409634      -1.57079633      0.00669999
-0.9000      -1.11976951      -1.11976951      0.00000000
-0.8000      -0.92729522      -0.92729522      0.00000000
-0.7000      -0.77539750      -0.77539750      0.00000000
-0.6000      -0.64350111      -0.64350111      0.00000000
-0.5000      -0.52359878      -0.52359878      0.00000000
-0.4000      -0.41151685      -0.41151685      0.00000000
-0.3000      -0.30469265      -0.30469265      0.00000000
-0.2000      -0.20135792      -0.20135792      0.00000000
-0.1000      -0.10016742      -0.10016742      0.00000000
0.0000      -0.00000000      -0.00000000      0.00000000
0.1000      0.10016742      0.10016742      0.00000000
0.2000      0.20135792      0.20135792      0.00000000
0.3000      0.30469265      0.30469265      0.00000000
0.4000      0.41151685      0.41151685      0.00000000
0.5000      0.52359878      0.52359878      0.00000000
0.6000      0.64350111      0.64350111      0.00000000
0.7000      0.77539750      0.77539750      0.00000000
0.8000      0.92729522      0.92729522      0.00000000
0.9000      1.11976951      1.11976951      0.00000000
1.0000      1.56409634      1.57079631      -0.00669996
x      arccos      Library      Difference
-      -      -      -
-1.0000      3.13489267      3.14159265      -0.00669999
-0.9000      2.69056584      2.69056584      -0.00000000
-0.8000      2.49809154      2.49809154      -0.00000000
-0.7000      2.34619382      2.34619382      -0.00000000
-0.6000      2.21429744      2.21429744      -0.00000000
-0.5000      2.09439510      2.09439510      -0.00000000
-0.4000      1.98231317      1.98231317      -0.00000000
-0.3000      1.87548898      1.87548898      -0.00000000
-0.2000      1.77215425      1.77215425      -0.00000000
-0.1000      1.67096375      1.67096375      -0.00000000
-0.0000      1.57079633      1.57079633      0.00000000
0.1000      1.47062891      1.47062891      0.00000000
0.2000      1.36943841      1.36943841      0.00000000
0.3000      1.26610367      1.26610367      0.00000000
0.4000      1.15927948      1.15927948      0.00000000
0.5000      1.04719755      1.04719755      0.00000000
0.6000      0.92729522      0.92729522      0.00000000
0.7000      0.79539883      0.79539883      0.00000000
0.8000      0.64350111      0.64350111      0.00000000
0.9000      0.45102681      0.45102681      0.00000000
1.0000      0.00669999      0.00000002      0.00669996
x      arctan      Library      Difference
-      -      -      -
1.0000      0.78539816      0.78539816      -0.00000000
1.1000      0.83298127      0.83298127      -0.00000000
1.2000      0.87605805      0.87605805      -0.00000000
1.3000      0.91510070      0.91510070      -0.00000000
1.4000      0.95054684      0.95054684      -0.00000000

```

As the result, there are some differences between my math program and math.h (there are many 0.00000000 and -0.00000000 meaning that there are small differences but the program can't show that many decimal places).

Why?

Because I wrote the arcsin program using Taylor series, we stopped calculating the term around 10^{-10} , so the rest of the terms won't calculate, which will cause the differences.

In Taylor series, during -1 to $-\frac{3}{4}$ and $\frac{3}{4}$ to 1 , the difference will be big due to trig identity. So I decided to use the inverse method based on that and finally solve the problem:(split a period of $\sin(x)$ into two big areas, find if the mid is $\sin(y) = x$? If not continue to split the original left area or right area into two area to find test middle point..... until EPSILON)

sancho@sancho-vc1:~/codebox\$./12zhongguo/assign25 ./matcnlib_test -g

x	arcSin	Library	Difference
-	-----	-----	-----
-1.0000	-1.57079633	-1.57079633	0.00000000
-0.9000	-1.11976951	-1.11976951	0.00000000
-0.8000	-0.92729522	-0.92729522	0.00000000
-0.7000	-0.77539750	-0.77539750	0.00000000
-0.6000	-0.64350111	-0.64350111	0.00000000
-0.5000	-0.52359878	-0.52359878	0.00000000
-0.4000	-0.41151685	-0.41151685	0.00000000
-0.3000	-0.30469265	-0.30469265	0.00000000
-0.2000	-0.20135792	-0.20135792	0.00000000
-0.1000	-0.10016742	-0.10016742	0.00000000
-0.0000	-0.00000000	-0.00000000	0.00000000
0.1000	0.10016742	0.10016742	-0.00000000
0.2000	0.20135792	0.20135792	-0.00000000
0.3000	0.30469265	0.30469265	-0.00000000
0.4000	0.41151685	0.41151685	-0.00000000
0.5000	0.52359878	0.52359878	-0.00000000
0.6000	0.64350111	0.64350111	-0.00000000
0.7000	0.77539750	0.77539750	-0.00000000
0.8000	0.92729522	0.92729522	-0.00000000
0.9000	1.11976951	1.11976951	0.00000000
1.0000	1.57079630	1.57079631	-0.00000000
x	arcCos	Library	Difference
-	-----	-----	-----
-1.0000	3.14159265	3.14159265	0.00000000
-0.9000	2.69056584	2.69056584	0.00000000
-0.8000	2.49809154	2.49809154	0.00000000
-0.7000	2.34619382	2.34619382	-0.00000000
-0.6000	2.21429744	2.21429744	-0.00000000
-0.5000	2.09439510	2.09439510	-0.00000000
-0.4000	1.98231317	1.98231317	-0.00000000
-0.3000	1.87548898	1.87548898	-0.00000000
-0.2000	1.77215425	1.77215425	-0.00000000
-0.1000	1.67096375	1.67096375	-0.00000000
-0.0000	1.57079633	1.57079633	0.00000000
0.1000	1.47062891	1.47062891	0.00000000
0.2000	1.36943841	1.36943841	0.00000000
0.3000	1.26610367	1.26610367	0.00000000
0.4000	1.15927948	1.15927948	0.00000000
0.5000	1.04719755	1.04719755	0.00000000
0.6000	0.92729522	0.92729522	0.00000000
0.7000	0.79539883	0.79539883	0.00000000
0.8000	0.64350111	0.64350111	0.00000000