

4. Elementary Transcendental Functions

Logarithmic, Exponential, Circular and Hyperbolic Functions

RUTH ZUCKER¹

Contents

	Page
Mathematical Properties	67
4.1. Logarithmic Function	67
4.2. Exponential Function	69
4.3. Circular Functions	71
4.4. Inverse Circular Functions	79
4.5. Hyperbolic Functions	83
4.6. Inverse Hyperbolic Functions	86
Numerical Methods	89
4.7. Use and Extension of the Tables	89
References	93
Table 4.1. Common Logarithms ($100 \leq x \leq 1350$)	95
$\log_{10} x$, $x=100(1)1350$, 10D	
Table 4.2. Natural Logarithms ($0 \leq x \leq 2.1$)	100
$\ln x$, $x=0(.001)2.1$, 16D	
Table 4.3. Radix Table of Natural Logarithms	114
$\ln(1+x)$, $-\ln(1-x)$, $x=10^{-n}(10^{-n})10^{-n+1}$, $n=10(-1)1$, 25D	
Table 4.4. Exponential Function ($0 \leq x \leq 100$)	116
e^x , $\pm x=0(.001)1$, 18D, $x=0(.1)5$, 15D	
$x=5(.1)10$, 12D, $-x=0(.1)10$, 20D	
$\pm x=0(1)100$, 19S	
Table 4.5. Radix Table of the Exponential Function	140
e^x , e^{-x} , $x=10^{-n}(10^{-n})10^{-n+1}$, $n=10(-1)1$, 25D	
Table 4.6. Circular Sines and Cosines for Radian Arguments ($0 \leq x \leq 1.6$)	142
$\sin x$, $\cos x$, $x=0(.001)1.6$, 23D	
Table 4.7. Radix Table of Circular Sines and Cosines	174
$\sin x$, $\cos x$, $x=10^{-n}(10^{-n})10^{-n+1}$, $n=10(-1)4$, 25D	
Table 4.8. Circular Sines and Cosines for Large Radian Arguments ($0 \leq x \leq 1000$)	175
$\sin x$, $\cos x$, $x=0(1)100$, 23D, $x=100(1)1000$, 8D	

¹ National Bureau of Standards.