

UNIVERSITY OF ILLINOIS

DIGITAL COMPUTER

LIBRARY ROUTINE TA 1 - 126

TITLE Sine Auxiliary for Floating Decimal (DOI or SADOI)
TYPE Closed Auxiliary for Floating Decimal
NUMBER OF WORDS 26
TEMPORARY STORAGE 0, 1
PARAMETERS S3, location of Floating Decimal Accumulator
S4, location of Floating Decimal Routine
S5, location of Library Routine A3
DURATION 13 milliseconds
DESCRIPTION This routine takes the number a from the floating accumulator and replaces it with $\sin a$. Entry is made with an 8J order and control is returned to 19S4.

The accuracy obtained with this routine is as good as one may expect from the accuracy of the argument. This will tend to be small for an argument having a large absolute value. When the argument is greater than 10^9 in absolute value, no significance may be attached to the result.

A cosine may be found with little additional trouble using this routine by adding $\pi/2$ to the argument before finding the sine. Thus one could write:

$$84N + 157079633 + 01$$
$$8J S7$$

where the location of the sine routine is here assumed to be given by S7 and where the constant listing auxiliary Routine XA 1 - 121 is used for forming $\pi/2$.

NOTE The coefficients in this routine were obtained by use of KA 1 - 123.

RT: 10/8/59

DATE 12/29/53 Rt: 6/5/58PROGRAMMED BY D. E. MullerAPPROVED BY J. P. Nash

LOCATION	ORDER		NOTES	PAGE 1
0	OOK(TAI) 50 S3			
	7J 19L		$x/2\pi$ in S3	
1	40 S3			
	50 1L			
2	26 S5		standard form	
	S9 20L			
3	S0 F			
	40 F			
4	1S F			
	40 F		$-1/2 \leq x/\pi < 1/2$	
5	L5 41S4			
	L0 1S3			
6	36 9L			
	L5 F		$x/2\pi$ in accumulator	
7	10 1F			
	40 S3			
8	L5 41S4			
	40 1S3			
9	50 F			
	7J F		x^2/π^2 in 1	
10	40 1F			
	L5 2L			
11	42 12L			
	23 12L			
12	79 1F			
	L4 (26)L		Form expansion	
13	40 F			
	F5 12L			
14	42 12L			
	L0 18L			
15	50 F			
	36 12L			
16	F5 1S3			
	40 1S3		retain accuracy if x is small	

LOCATION	ORDER	NOTES	PAGE 2
17	7J S3 22 18S4		
18	L9 LF L4 26L		
19	00 F 00 318 309 886 184J		1/π
20	00 F 00 702 838 641J		
21	00 F 00 820 504 0181J		
22	00 F 00 599 252 19782J		
23	00 F 00 255 016 331 895J		
24	40 F 00 167 712 76462J		
25	00 F 00 31415 9265354J		

TA 1