Values of $\frac{2}{\pi}\int_0^\infty \left(\frac{\sin t}{t}\right)^n dt$

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In discussing the equation of state for the molecules of one-dimensional square well potential [1], the first two authors required the numerical values of the integral

$$I_n = \frac{2}{\pi}\int_0^\infty \left(\frac{\sin t}{t}\right)^n dt = \frac{1}{2^{n-1}\Gamma(n)} \sum_{p=0}^{[(n-1)/2]} (-1)^p \binom{n}{p} (n-2p)^{n-1}.$$

Inasmuch as these values seem to be of use in other applications, and apparently have not been previously tabulated, the first two authors calculated on SENAC-1 (Sendai Automatic Computer 1) a six-place table of I_n for $n = 1(1)\ 30$.

The last author reviewed this table and recalculated the data, finding the corresponding exact rational values.

The authors have decided to publish the ten-place table of I_n which is appended.

TABLE OF $I_n \equiv \frac{2}{\pi}\int_0^\infty \left(\frac{\sin t}{t}\right)^n dt$

n	I_n	n	I_n
1	1.00000 00000	16	0.34224 02614
2	1.00000 00000	17	0.33220 82691
3	0.75000 00000	18	0.32300 93942
4	0.66666 66667	19	0.31453 44009
5	0.59895 83333	20	0.30669 31017
6	0.55000 00000	21	0.29941 02903
7	0.51102 43056	22	0.29262 26872
8	0.47936 50794	23	0.28627 66141
9	0.45292 09682	24	0.28032 61985
10	0.43041 77690	25	0.27473 19735
11	0.41096 26428	26	0.26945 97712
12	0.39392 55652	27	0.26447 98425
13	0.37884 40845	28	0.25976 61480
14	0.36537 08695	29	0.25529 57845
15	0.35323 91567	30	0.25104 85320

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Received August 6, 1959; revised March 7, 1960.