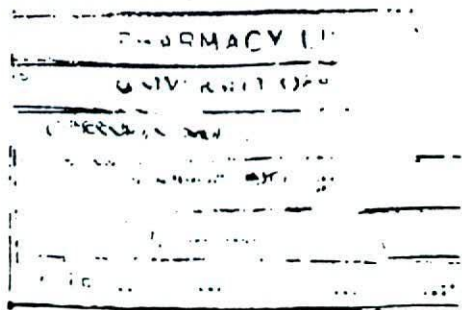
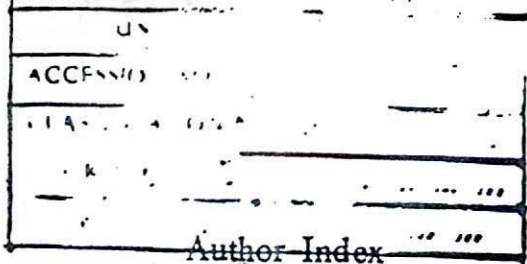


Answers To Problems

- P2.1. 99.22%.
P2.2. 103.56% of the stated amount.
P2.3. Four extractions are required: 1.20 g, 0.24 g, 0.048 g, and 0.0096 g are removed by the first, second, third, and fourth extractions, respectively.
P2.4. 0.1483 g or 129.8% excess.
- P3.1. (a) 1.70; (b) 1.31; (c) 1.00, 1.30; (d) 3.98×10^{-1} .
P3.2. (a) 5×10^{-1} , 6.67×10^{-1} , 2×10^{-1} , 1×10^{-1} ; (b) 13.70, 12.82, 12.30, 12.00; (c) 10.00, 10.86, 11.37; (d) 12.67.
P3.3. (a) 9.4×10^{-4} , 3.03; (b) 1.2×10^{-3} , 1.92; (c) 6.9×10^{-4} , 5.16.
P3.4. (a) 2.95×10^{-3} , 11.47; (b) 4.1×10^{-3} , 9.61; (c) 2.3×10^{-3} , 11.36.
P3.5. 5.12.
P3.6. 1.778 to 1.
P3.7. 0.0196, 0.0195.
P3.8. 0.00253 *N*.
P3.9. 4.77 g.
P3.10. (a) 0.938%; (b) 1.87×10^{-3} ; (c) 2.73.
P3.11. (a) 0.0088%; (b) 1.76×10^{-3} ; (c) 4.75.
P3.13. 97.12%.
- P5.1. (a) 5.517 g; (b) 300 mg; (c) 8.58 ml; (d) 84.38 meq; (e) 60 ml.
P5.2. (a) 112.5 ml; (b) 0.3018 *N*; (c) 0.7875 *N*; (d) 19.00 ml; (e) 0.1062 *N*.
P5.3. 7.59%.
P5.4. 92.49%, 6.70%.
P5.5. 3.54 ml, 14.52 ml.
P5.6. 0.1137 *N*.
P5.7. 0.2611 *N*.
P5.8. 35.50 ml.
P5.9. 325.0 mg or 5 grains.
P5.10. 98.97%.
P5.11. 98.76%.
- P12.1. 5.61.
P12.2. 190.
P12.3. 173 ml.
P12.4. 117.





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Numbers in parentheses are reference numbers and indicate that an author's work is referred to although his name is not cited in the text. Numbers in italics give the page on which the complete reference is listed.

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x	0	1	2	3	4	5	6	7	8	9	Δ	ADD								
												1 2 3			4 5 6			7 8 9		
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54	.7324	7332	7340	7348	7356	7364	7372	7380	7388	7396	8	1	2	2	3	4	5	6	6	
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68	.8325	8331	8338	8344	8351	8357	8363	8370	8376	8382		1	1	2	3	4	4	5	6	
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72	.8573	8579	8585	8591	8597	8603	8609	8615	8621	8627		1	1	2	2	3	4	4	5	
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75	.8751	8756	8762	8768	8774	8779	8785	8791	8797	8802		1	1	2	2	3	3	4	5	
76	.8808	8814	8820	8825	8831	8837	8842	8848	8854	8859		1	1	2	2	3	3	4	5	
77	.8865	8871	8876	8882	8887	8893	8899	8904	8910	8915		1	1	2	2	3	3	4	5	
78	.8921	8927	8932	8938	8943	8949	8954	8960	8965	8971		1	1	2	2	3	3	4	5	
79	.8976	8982	8987	8993	8998	9004	9009	9015	9020	9025		1	1	2	2	3	3	4	5	
80	.9031	9036	9042	9047	9053	9058	9063	9069	9074	9079		1	1	2	2	3	3	4	5	
81	.9085	9090	9096	9101	9106	9112	9117	9122	9128	9133		1	1	2	2	3	3	4	5	
82	.9138	9143	9149	9154	9159	9165	9170	9175	9180	9186		1	1	2	2	3	3	4	5	
83	.9191	9196	9201	9206	9212	9217	9222	9227	9232	9238		1	1	2	2	3	3	4	5	
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86	.9345	9350	9355	9360	9365	9370	9375	9380	9385	9390	5	1	1	2	2	3	3	4	5	
87	.9395	9400	9405	9410	9415	9420	9425	9430	9435	9440		0	1	1	2	2	3	3	4	
88	.9445	9450	9455	9460	9465	9469	9474	9479	9484	9489		0	1	1	2	2	3	3	4	
89	.9494	9499	9504	9509	9513	9518	9523	9528	9533	9538		0	1	1	2	2	3	3	4	
90	.9542	9547	9552	9557	9562	9566	9571	9576	9581	9586		0	1	1	2	2	3	3	4	
91	.9590	9595	9600	9605	9609	9614	9619	9624	9628	9633		0	1	1	2	2	3	3	4	
92	.9638	9643	9647	9652	9657	9661	9666	9671	9675	9680		0	1	1	2	2	3	3	4	
93	.9685	9689	9694	9699	9703	9708	9713	9717	9722	9727		0	1	1	2	2	3	3	4	
94	.9731	9736	9741	9745	9750	9754	9759	9763	9768	9773		0	1	1	2	2	3	3	4	
95	.9777	9782	9786	9791	9795	9800	9805	9809	9814	9818		0	1	1	2	2	3	3	4	
96	.9823	9827	9832	9836	9841	9845	9850	9854	9859	9863		0	1	1	2	2	3	3	4	
97	.9868	9872	9877	9881	9886	9890	9894	9899	9903	9908		0	1	1	2	2	3	3	4	
98	.9912	9917	9921	9926	9930	9934	9939	9943	9948	9952		0	1	1	2	2	3	3	4	
99	.9956	9961	9965	9969	9974	9978	9983	9987	9991	9996	4	0	1	1	2	2	3	3	4	

Only the decimal portion (mantissa) of each logarithm is shown in this table. The integral portion (characteristic) must be determined independently.

LOGARITHMS OF NUMBERS

x										Δ	ADD									
	0	1	2	3	4	5	6	7	8		9	1	2	3	4	5	6	7	8	9
10	-0000	0043	0086	0128	0170	0212					42	4	8	13	17	21	25	29	34	38
						0212	0253	0294	0334	0374	40	4	8	12	16	20	24	28	32	36
11	-0414	0453	0492	0531	0569	0607					39	4	8	12	16	19	23	27	31	35
						0607	0645	0682	0719	0755	37	4	7	11	15	18	22	26	30	33
12	-0792	0828	0864	0899	0934	0969					35	4	7	11	14	18	21	25	28	32
						0969	1004	1038	1072	1106	34	3	7	10	14	17	20	24	27	31
13	-1139	1173	1206	1239	1271	1303					33	3	7	10	13	16	19	23	26	30
						1303	1335	1367	1399	1430	32	3	6	10	13	16	19	22	26	29
14	-1461	1492	1523	1553	1584	1614	1644	1673	1703	1732	30	3	6	9	12	15	18	21	24	27
15	-1761	1790	1818	1847	1875	1903	1931	1959	1987	2014	28	3	6	8	11	14	17	20	22	25
16	-2041	2068	2095	2122	2148	2175	2201	2227	2253	2279	26	3	5	8	10	13	16	18	21	23
17	-2304	2330	2355	2380	2405	2430	2455	2480	2504	2529	25	2	5	7	10	12	15	17	20	22
18	-2553	2577	2601	2625	2648	2672	2695	2718	2742	2765	23	2	5	7	9	12	14	16	19	21
19	-2788	2810	2833	2856	2878	2900	2923	2945	2967	2989	22	2	4	7	9	11	13	15	18	20
20	-3010	3032	3054	3075	3096	3118	3139	3160	3181	3201	21	2	4	6	8	11	13	15	17	19
21	-3222	3243	3263	3284	3304	3324	3345	3365	3385	3404	20	2	4	6	8	10	12	14	16	18
22	-3424	3444	3464	3483	3502	3522	3541	3560	3579	3598	19	2	4	6	8	10	11	13	15	17
23	-3617	3636	3655	3674	3692	3711	3729	3747	3766	3784	18	2	4	6	7	9	11	13	15	17
24	-3802	3820	3838	3856	3874	3892	3909	3927	3945	3962	18	2	4	5	7	9	11	13	14	16
25	-3979	3997	4014	4031	4048	4065	4082	4099	4116	4133	17	2	3	5	7	9	10	12	14	15
26	-4150	4166	4183	4200	4216	4232	4249	4265	4281	4298	16	2	3	5	6	8	10	11	13	14
27	-4314	4330	4346	4362	4378	4393	4409	4425	4440	4456	16	2	3	5	6	8	9	11	13	14
28	-4472	4487	4502	4518	4533	4548	4564	4579	4594	4609	15	2	3	5	6	8	9	11	12	14
29	-4624	4639	4654	4669	4683	4698	4713	4728	4742	4757	15	1	3	4	6	7	9	10	12	13
30	-4771	4786	4800	4814	4829	4843	4857	4871	4886	4900	14	1	3	4	5	7	8	10	11	13
31	-4914	4928	4942	4955	4969	4983	4997	5011	5024	5038	13	1	3	4	5	7	8	10	11	12
32	-5051	5065	5079	5092	5105	5119	5132	5145	5159	5172	13	1	3	4	5	7	8	9	11	12
33	-5186	5198	5211	5224	5237	5250	5263	5276	5289	5302	13	1	3	4	5	7	8	9	10	12
34	-5315	5328	5340	5353	5366	5378	5391	5403	5416	5428	13	1	3	4	5	6	8	9	10	11
35	-5441	5453	5465	5478	5490	5502	5514	5527	5539	5551	12	1	2	4	5	6	7	8	10	11
36	-5563	5575	5587	5599	5611	5623	5635	5647	5658	5670	12	1	2	4	5	6	7	8	10	11
37	-5682	5694	5705	5717	5729	5740	5752	5763	5775	5786	12	1	2	3	5	6	7	8	9	10
38	-5798	5809	5821	5832	5843	5855	5866	5877	5888	5899	11	1	2	3	5	6	7	8	9	10
39	-5911	5922	5933	5944	5955	5966	5977	5988	5999	6010	11	1	2	3	4	6	7	8	9	10
40	-6021	6031	6042	6053	6064	6075	6085	6096	6107	6117	10	1	2	3	4	5	6	7	8	9
41	-6128	6138	6149	6160	6170	6180	6191	6201	6212	6222	10	1	2	3	4	5	6	7	8	9
42	-6232	6243	6253	6263	6274	6284	6294	6304	6314	6325	10	1	2	3	4	5	6	7	8	9
43	-6335	6345	6355	6365	6375	6385	6395	6405	6415	6425	10	1	2	3	4	5	6	7	8	9
44	-6435	6444	6454	6464	6474	6484	6493	6503	6513	6522	10	1	2	3	4	5	6	7	8	9
45	-6532	6542	6551	6561	6571	6580	6590	6599	6609	6618	9	1	2	3	4	5	6	7	8	9
46	-6628	6637	6646	6656	6665	6675	6684	6693	6702	6712	9	1	2	3	4	5	6	7	8	9
47	-6721	6730	6739	6749	6758	6767	6776	6785	6794	6803	9	1	2	3	4	5	6	7	8	9
48	-6812	6821	6830	6839	6848	6857	6866	6875	6884	6893	9	1	2	3	4	5	6	7	8	9
49	-6902	6911	6920	6928	6937	6946	6955	6964	6972	6981	9	1	2	3	4	5	6	7	8	9

USEFUL CONSTANTS WITH THEIR LOGARITHMS

	No.	Log.	No.	Log.	No.	Log.		
π	3.14159	0.4971	1 radian	57°-29'6"	1.7581	e	2.71828	0.4343
$\frac{1}{\pi}$	0.3183	1.5029		3437"-7	3.5363	M	0.4343	1.6378
$\frac{1}{\pi^2}$	9.8696	0.9943		206265"	5.3144	$\frac{1}{M}$	2.3026	0.3622
$\sqrt{\pi}$	1.7725	0.2486	arc 1°	0.017 453 293	2.2419	$\log_e x = \frac{1}{M} \log_{10} x$		
$\frac{4}{3}\pi$	4.1888	0.6221	arc 1'	0.000 290 888	4.4637	$\log_{10} x = M \cdot \log_e x$		
			arc 1"	0.000 004 848	6.6856			

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