Figure 13.13. SIX PERCENTILES FOR THE F DISTRIBUTION $[F_{\nu_1,\nu_2}]$

[Calculated with *qf* in **R** Version 3.3.2 using 17-digit arithmetic; the accuracy of all digits in the table entries has *not* been verified]

Each table entry is the value (y) of the random variable $Y \sim F_{\nu_1,\nu_2}$ such that $\Pr(Y \le y) = p^*$ ($p^* = 0.9, ..., .9999$) (ν_1 is the numerator, ν_2 the denominator, degrees of freedom)

$Df \rightarrow \nu_1$ / ν_2	p^*	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	50	60	75	100	175	350	1,000	
35	.9	2.8547	2.4609	2.2474	2.1128	2.0191	1.9496	1.8957	1.8524	1.8168	1.7869	1.7394	1.6880	1.6317	1.5950	1.5691	1.5346	1.5127	1.4975	1.4817	1.4653	1.4431	1.4277	1.4172	35
	.95	4.1213	3.2674	2.8742	2.6415	2.4851	2.3718	2.2852	2.2167	2.1608	2.1143	2.0411	1.9629	1.8784	1.8239	1.7856	1.7351	1.7032	1.6811	1.6583	1.6347	1.6030	1.5809	1.5661	
	.975	5.4848	4.1065	3.5166	3.1785	2.9557	2.7961	2.6755	2.5807	2.5039	2.4403	2.3406	2.2350	2.1218	2.0493	1.9986	1.9321	1.8902	1.8613	1.8316	1.8009	1.7598	1.7312	1.7121	
	.99	7.4191	5.2679	4.3957	3.9082	3.5919	3.3679	3.2000	3.0687	2.9630	2.8758	2.7400	2.5970	2.4448	2.3480	2.2806	2.1926	2.1374	2.0994	2.0604	2.0202	1.9666	1.9294	1.9046	
	.999	12.8963	8.4697	6.7870	5.8764	5.2978	4.8942	4.5950	4.3634	4.1782	4.0265	3.7920	3.5474	3.2903	3.1283	3.0163	2.8711	2.7806	2.7187	2.6552	2.5902	2.5038	2.4443	2.4046	
	.9999	19.2615	12.1217	9.4873	8.0844	7.2025	6.5923	6.1427	5.7964	5.5209	5.2959	4.9495	4.5906	4.2156	3.9808	3.8193	3.6106	3.4812	3.3928	3.3025	3.2102	3.0880	3.0040	2.9482	
40	.9	2.8354	2.4404	2.2261	2.0909	1.9968	1.9269	1.8725	1.8289	1.7929	1.7627	1.7146	1.6624	1.6052	1.5677	1.5411	1.5056	1.4830	1.4672	1.4507	1.4336	1.4104	1.3941	1.3830	40
	.95	4.0847	3.2317	2.8387	2.6060	2.4495	2.3359	2.2490	2.1802	2.1240	2.0772	2.0035	1.9245	1.8389	1.7835	1.7444	1.6928	1.6600	1.6373	1.6137	1.5892	1.5562	1.5331	1.5175	
	.975	5.4239	4.0510	3.4633	3.1261	2.9037	2.7444	2.6238	2.5289	2.4519	2.3882	2.2882	2.1819	2.0677	1.9943	1.9429	1.8752	1.8324	1.8028	1.7722	1.7405	1.6979	1.6682	1.6481	
	.99	7.3141	5.1785	4.3126	3.8283	3.5138	3.2910	3.1238	2.9930	2.8876	2.8005	2.6648	2.5216	2.3689	2.2714	2.2034	2.1142	2.0581	2.0194	1.9795	1.9383	1.8831	1.8447	1.8189	
	.999	12.6094	8.2508	6.5945	5.6981	5.1283	4.7306	4.4355	4.2070	4.0243	3.8744	3.6425	3.4003	3.1450	2.9838	2.8721	2.7268	2.6360	2.5737	2.5097	2.4439	2.3562	2.2955	2.2549	
	.9999	18.6684	11.6979	9.1278	7.7592	6.8987	6.3031	5.8640	5.5257	5.2564	5.0363	4.6973	4.3455	3.9772	3.7461	3.5868	3.3804	3.2520	3.1642	3.0742	2.9820	2.8594	2.7749	2.7185	
45	.9	2.8205	2.4245	2.2097	2.0742	1.9796	1.9094	1.8547	1.8107	1.7745	1.7440	1.6954	1.6426	1.5846	1.5464	1.5193	1.4830	1.4597	1.4434	1.4264	1.4087	1.3845	1.3674	1.3558	45
	.95	4.0566	3.2043	2.8115	2.5787	2.4221	2.3083	2.2212	2.1521	2.0958	2.0487	1.9745	1.8949	1.8084	1.7522	1.7126	1.6599	1.6264	1.6031	1.5789	1.5536	1.5194	1.4953	1.4790	
	.975	5.3773	4.0085	3.4224	3.0860	2.8640	2.7048	2.5842	2.4892	2.4122	2.3483	2.2480	2.1412	2.0262	1.9521	1.9000	1.8313	1.7876	1.7574	1.7261	1.6935	1.6496	1.6187	1.5979	
	.99	7.2339	5.1103	4.2492	3.7674	3.4544	3.2325	3.0658	2.9353	2.8301	2.7432	2.6076	2.4642	2.3109	2.2129	2.1443	2.0542	1.9972	1.9579	1.9172	1.8751	1.8185	1.7788	1.7521	
	.999	12.3922	8.0855	6.4495	5.5639	5.0007	4.6075	4.3157	4.0895	3.9086	3.7601	3.5301	3.2897	3.0357	2.8750	2.7635	2.6180	2.5268	2.4640	2.3995	2.3330	2.2439	2.1820	2.1404	
	.9999	18.2240	11.3813	8.8598	7.5172	6.6728	6.0881	5.6571	5.3248	5.0601	4.8437	4.5102	4.1637	3.8004	3.5720	3.4142	3.2094	3.0817	2.9940	2.9042	2.8118	2.6886	2.6033	2.5462	
50	.9	2.8087	2.4120	2.1967	2.0608	1.9660	1.8954	1.8405	1.7963	1.7598	1.7291	1.6802	1.6269	1.5681	1.5294	1.5018	1.4648	1.4409	1.4242	1.4068	1.3885	1.3634	1.3456	1.3334	50
	.95	4.0343	3.1826	2.7900	2.5572	2.4004	2.2864	2.1992	2.1299	2.0734	2.0261	1.9515	1.8714	1.7841	1.7273	1.6872	1.6337	1.5995	1.5757	1.5508	1.5249	1.4896	1.4647	1.4477	
	.975	5.3403	3.9749	3.3902	3.0544	2.8327	2.6736	2.5530	2.4579	2.3808	2.3168	2.2162	2.1090	1.9933	1.9186	1.8659	1.7963	1.7520	1.7211	1.6892	1.6558	1.6107	1.5788	1.5572	
	.99	7.1706	5.0566	4.1993	3.7195	3.4077	3.1864	3.0202	2.8900	2.7850	2.6981	2.5625	2.4190	2.2652	2.1667	2.0976	2.0066	1.9490	1.9090	1.8677	1.8248	1.7667	1.7260	1.6984	
	.999	12.2221	7.9564	6.3364	5.4593	4.9013	4.5117	4.2224	3.9980	3.8185	3.6711	3.4426	3.2035	2.9506	2.7902	2.6787	2.5329	2.4413	2.3782	2.3131	2.2458	2.1555	2.0924	2.0499	
	.9999	17.8786	11.1360	8.6524	7.3301	6.4983	5.9222	5.4974	5.1698	4.9087	4.6952	4.3660	4.0237	3.6642	3.4378	3.2811	3.0774	2.9500	2.8625	2.7726	2.6799	2.5559	2.4697	2.4118	
60	.9	2.7911	2.3933	2.1774	2.0410	1.9457	1.8747	1.8194	1.7748	1.7380	1.7070	1.6574	1.6034	1.5435	1.5039	1.4755	1.4373	1.4126	1.3952	1.3769	1.3576	1.3311	1.3120	1.2988	60
	.95	4.0012	3.1504	2.7581	2.5252	2.3683	2.2541	2.1665	2.0970	2.0401	1.9926	1.9174	1.8364	1.7480	1.6902	1.6491	1.5943	1.5590	1.5343	1.5085	1.4814	1.4442	1.4176	1.3994	
	.975	5.2856	3.9253	3.3425	3.0077	2.7863	2.6274	2.5068	2.4117	2.3344	2.2702	2.1692	2.0613	1.9445	1.8687	1.8152	1.7440	1.6985	1.6668	1.6337	1.5990	1.5517	1.5180	1.4950	
F_{ν_1,ν_2}	.99	7.0771	4.9774	4.1259	3.6490	3.3389	3.1187	2.9530	2.8233	2.7185	2.6318	2.4961	2.3523	2.1978	2.0984	2.0285	1.9360	1.8772	1.8363	1.7937	1.7493	1.6889	1.6461	1.6169	F_{ν_1,ν_2}
	.999	11.9730	7.7678	6.1712	5.3067	4.7565	4.3721	4.0864	3.8648	3.6873	3.5415	3.3153	3.0781	2.8266	2.6665	2.5549	2.4086	2.3162	2.2523	2.1862	2.1175	2.0247	1.9593	1.9150	
	.9999	17.3769	10.7807	8.3526	7.0599	6.2465	5.6830	5.2672	4.9465	4.6907	4.4815	4.1585	3.8221	3.4681	3.2445	3.0894	2.8870	2.7599	2.6723	2.5820	2.4886	2.3628	2.2746	2.2150	
70	.9	2.7786	2.3800	2.1637	2.0269	1.9313	1.8600	1.8044	1.7596	1.7225	1.6913	1.6413	1.5866	1.5259	1.4857	1.4567	1.4176	1.3922	1.3742	1.3552	1.3352	1.3073	1.2871	1.2730	70
	.95	3.9778	3.1277	2.7355	2.5027	2.3456	2.2312	2.1435	2.0737	2.0166	1.9689	1.8932	1.8117	1.7223	1.6638	1.6220	1.5661	1.5300	1.5046	1.4779	1.4498	1.4110	1.3831	1.3638	
	.975	5.2470	3.8903	3.3090	2.9748	2.7537	2.5949	2.4743	2.3791	2.3017	2.2374	2.1361	2.0277	1.9100	1.8334	1.7792	1.7069	1.6604	1.6279	1.5939	1.5581	1.5089	1.4736	1.4493	
	.99	7.0114	4.9219	4.0744	3.5996	3.2907	3.0712	2.9060	2.7765	2.6719	2.5852	2.4496	2.3055	2.1504	2.0503	1.9797	1.8861	1.8263	1.7846	1.7410	1.6954	1.6329	1.5882	1.5576	
	.999	11.7993	7.6366	6.0566	5.2008	4.6561	4.2753	3.9922	3.7725	3.5964	3.4517	3.2271	2.9912	2.7405	2.5807	2.4689	2.3220	2.2289	2.1643	2.0972	2.0274	1.9323	1.8649	1.8188	
	.9999	17.0302	10.5359	8.1465	6.8743	6.0738	5.5190	5.1095	4.7935	4.5414	4.3351	4.0164	3.6841	3.3338	3.1121	2.9579	2.7563	2.6292	2.5414	2.4506	2.3563	2.2287	2.1385	2.0772	
80	.9	2.7693	2.3701	2.1535	2.0165	1.9206	1.8491	1.7933	1.7483	1.7110	1.6796	1.6292	1.5741	1.5128	1.4720	1.4426	1.4027	1.3767	1.3583	1.3388	1.3180	1.2890	1.2678	1.2530	80
	.95	3.9604	3.1108	2.7188	2.4859	2.3287	2.2142	2.1263	2.0564	1.9991	1.9512	1.8753	1.7932	1.7032	1.6440	1.6017	1.5449	1.5081	1.4821	1.4548	1.4259	1.3857	1.3565	1.3362	
	.975	5.2184	3.8643	3.2841	2.9504	2.7295	2.5708	2.4502	2.3549	2.2775	2.2130	2.1115	2.0026	1.8843	1.8071	1.7523	1.6790	1.6318	1.5987	1.5639	1.5271	1.4763	1.4396	1.4141	
	.99	6.9627	4.8807	4.0363	3.5631	3.2550	3.0361	2.8713	2.7420	2.6374	2.5508	2.4151	2.2709	2.1153	2.0146	1.9435	1.8489	1.7883	1.7459	1.7015	1.6548	1.5905	1.5442	1.5122	
	.999	11.6714	7.5401	5.9723	5.1231	4.5824	4.2043	3.9232	3.7049	3.5298	3.3859	3.1624	2.9274	2.6774	2.5176	2.4057	2.2582	2.1644	2.0992	2.0314	1.9604	1.8634	1.7940	1.7464	
	.9999	16.7764	10.3670	7.9960	6.7390	5.9479	5.3996	4.9947	4.6822	4.4328	4.2286	3.9131	3.5838	3.2361	3.0157	2.8622	2.6609	2.5338	2.4457	2.3544	2.2593	2.1298	2.0378	1.9748	
90	.9	2.7621	2.3625	2.1457	2.0084	1.9123	1.8406	1.7846	1.7395	1.7021	1.6705	1.6199	1.5644	1.5025	1.4613	1.4315	1.3911	1.3646	1.3457	1.3258	1.3044	1.2745	1.2524	1.2368	90
	.95	3.9469	3.0977	2.7058	2.4729	2.3157	2.2011	2.1131	2.0430	1.9856	1.9376	1.8613	1.7789	1.6883	1.6286	1.5859	1.5284	1.4910	1.4645	1.4366	1.4070	1.3656	1.3353	1.3140	
	.975	5.1962	3.8443	3.2649	2.9315	2.7109	2.5522	2.4316	2.3363	2.2588	2.1942	2.0925	1.9833	1.8644	1.7867	1.7315	1.6574	1.6095	1.5758	1.5404	1.5028	1.4506	1.4126	1.3860	
	.99	6.9251	4.8491	4.0070	3.5350	3.2276	3.0091	2.8445	2.7154	2.6109	2.5243	2.3886	2.2442	2.0882	1.9871	1.9155	1.8201	1.7588	1.7158	1.6707	1.6231	1.5572	1.5094	1.4762	
	.999	11.5732	7.4661	5.9078	5.0636	4.5260	4.1500	3.8703	3.6531	3.4789	3.3356	3.1129	2.8787	2.6291	2.4693	2.3572	2.2092	2.1149	2.0491	1.9806	1.9086	1.8098	1.7387	1.6895	
	.9999	16.5825	10.2206	7.8814	6.6360	5.8521	5.3087	4.9074	4.5976	4.3502	4.1477	3.8346	3.5076	3.1619	2.9424	2.7894	2.5884	2.4611	2.3727	2.2809	2.1849	2.0538	1.9600	1.8954	
100	.9	2.7564	2.3564	2.1394	2.0019	1.9057	1.8339	1.7778	1.7324	1.6949	1.6632	1.6124	1.5566	1.4943	1.4528	1.4227	1.3817	1.3548	1.3356	1.3153	1.2934	1.2626	1.2397	1.2235	100
	.95	3.9361	3.0873	2.6955	2.4626	2.3053	2.1906	2.1025	2.0323	1.9748	1.9267	1.8503	1.7675	1.6764	1.6163	1.5733	1.5151	1.4772	1.4504	1.4220	1.3917	1.3492	1.3179	1.2958	
	.975	5.1786	3.8284	3.2496	2.9166	2.6961	2.5374	2.4168	2.3215	2.2439	2.1793	2.0773	1.9679	1.8486	1.7705	1.7148	1.6401	1.5917	1.5575	1.5215	1.4833	1.4298	1.3906	1.3630	
	.99	6.8953	4.8239	3.9837	3.5127	3.2059	2.9877	2.8233	2.6943	2.5898	2.5033	2.3676	2.2230	2.0666	1.9652	1.8933	1.7972	1.7353	1.6918	1.6461	1.5977	1.5303	1.4812	1.4468	
	.999	11.4954	7.4077	5.8568	5.0167	4.4815	4.1071	3.8286	3.6123	3.4387	3.2959	3.0739	2.8402	2.5909	2.4311	2.3189	2.1704	2.0756	2.0094	1.9402	1.8674	1.7669	1.6942	1.6436	
	.9999	16.4295	10.1132	7.7912	6.5550	5.7768	5.2373	4.8388	4.5311	4.2854	4.0841	3.7729	3.4477	3.1037	2.8849	2.7322	2.5313	2.4038	2.3151	2.2228	2.1261	1.9934	1.8979	1.8318	
125	.9	2.7461	2.3455	2.1281	1.9904	1.8939	1.8218	1.7654	1.7199	1.6821	1.6502	1.5990	1.5427	1.4796	1.4374	1.4067	1.3648	1.3371	1.3173	1.2961	1.2732	1.2406	1.2160	1.1983	125
	.95	3.9169	3.0687	2.6771	2.4442	2.2868	2.1719	2.0836	2.0133	1.9556	1.9072	1.8304	1.7471	1.6551	1.5943	1.5505	1.4912	1.4524	1.4247	1.3953	1.3638	1.3191	1.2856	1.2616	
	.975	5.1471	3.7999	3.2224	2.8899	2.6696	2.5110	2.3904	2.2950	2.2173	2.1526	2.0503	1.9404	1.8202	1.7413	1.6850	1.6090	1.5595	1.5244	1.4873	1.4476	1.3915	1.3498	1.3200	
	.99	6.8421	4.7791	3.9422	3.4729	3.1671	2.9495	2.7855	2.6567	2.5524	2.4659	2.3301	2.1852	2.0282	1.9260	1.8534	1.7560	1.6930	1.6485	1.6015	1.5515	1.4812	1.4292	1.3922	
	.999	11.3573	7.3040	5.7664	4.9334	4.4026	4.0312	3.7548	3.5399	3.3675	3.2255	3.0047	2.7720	2.5232	2.3634	2.2509	2.1014	2.0056	1.9384	1.8680	1.7934	1.6895	1.6133	1.5595	
	.9999	16.1591	9.9236	7.6322	6.4122	5.6442	5.1116	4.7181	4.4141	4.1713	3.9723	3.6645	3.3424	3.0011	2.7836	2.6314	2.4305	2.3026	2.2132	2.1199	2.0216	1.8855	1.7862	1.7166	
		1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	50	60	75	100	175	350	1,000	

(continued)

2017-02-20

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