University of Waterloo

99.95*th* PERCENTILES FOR THE *F* DISTRIBUTION [F_{ν_1,ν_2}]

[Calculated with *qf* in **R** Version 3.2.2 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 $\Pr(Y \le y) = 0.9995$ (ν_1 is the numerator, ν_2 the denominator, degrees of freedom)

F_{ν_1,ν_2} .9995

Df → ν_2 ↓ / ν_1	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	50	60	75	100	175	350	1,000	
1	1621138	2000000	2161518	2250000	2305619	2343750	2371494	2392578	2409137	2422485	2442672	2463056	2483632	2496068	2504397	2514849	2521143	2525347	2529559	2533778	2539214	2542844	2545206	1
2	1998.5	1999.0	1999.2	1999.2	1999.3	1999.3	1999.4	1999.4	1999.4	1999.4	1999.4	1999.4	1999.4	1999.5	1999.5	1999.5	1999.5	1999.5	1999.5	1999.5	1999.5	1999.5	1999.5	
3	266.55	236.61	224.70	218.25	214.20	211.41	209.38	207.83	206.61	205.63	204.13	202.62	201.08	200.15	199.53	198.74	198.27	197.95	197.63	197.31	196.90	196.62	196.44	
4	106.219	87.443	80.092	76.124	73.631	71.916	70.663	69.708	68.955	68.346	67.421	66.483	65.530	64.951	64.561	64.071	63.775	63.577	63.378	63.179	62.921	62.749	62.637	
5	63.611	49.782	44.422	41.534	39.719	38.470	37.557	36.859	36.309	35.864	35.187	34.499	33.799	33.372	33.086	32.724	32.506	32.359	32.212	32.065	31.874	31.746	31.663	5
6	46.082	34.798	30.453	28.115	26.645	25.633	24.892	24.325	23.878	23.516	22.964	22.403	21.831	21.482	21.247	20.950	20.771	20.650	20.529	20.408	20.251	20.145	20.077	
7	36.988	27.206	23.457	21.441	20.173	19.298	18.658	18.168	17.781	17.467	16.989	16.501	16.003	15.699	15.494	15.235	15.078	14.972	14.866	14.760	14.622	14.530	14.469	
8	31.555	22.750	19.387	17.578	16.440	15.655	15.080	14.639	14.291	14.008	13.577	13.136	12.686	12.410	12.224	11.989	11.846	11.750	11.654	11.557	11.431	11.346	11.291	
9	27.9910	19.8655	16.7700	15.1060	14.0583	13.3351	12.8044	12.3978	12.0759	11.8146	11.4159	11.0081	10.5903	10.3342	10.1611	9.9419	9.8086	9.7191	9.6290	9.5382	9.4206	9.3416	9.2900	
10	25.4291	17.8653	14.9655	13.4068	12.4251	11.7469	11.2489	10.8671	10.5646	10.3189	9.9436	9.5594	9.1651	8.9231	8.7592	8.5515	8.4251	8.3401	8.2545	8.1682	8.0563	7.9810	7.9318	10
11	23.6520	16.4053	13.6545	12.1759	11.2442	10.6002	10.1270	9.7639	9.4762	9.2423	8.8847	8.5182	8.1415	7.9100	7.7530	7.5538	7.4325	7.3508	7.2684	7.1854	7.0776	7.0051	6.9576	
12	22.2450	15.2972	12.6632	11.2474	10.3549	9.7377	9.2839	8.9355	8.6593	8.4346	8.0908	7.7381	7.3750	7.1515	6.9999	6.8071	6.6896	6.6104	6.5306	6.4500	6.3453	6.2747	6.2285	
13	21.1367	14.4298	11.8897	10.5244	9.6635	9.0678	8.6296	8.2930	8.0259	7.8086	7.4758	7.1341	6.7818	6.5646	6.4171	6.2294	6.1149	6.0376	5.9597	5.8810	5.7785	5.7095	5.6642	
14	20.2424	13.7336	11.2707	9.9469	9.1118	8.5337	8.1083	7.7813	7.5217	7.3104	6.9867	6.6538	6.3103	6.0982	5.9541	5.7704	5.6582	5.5825	5.5060	5.4287	5.3280	5.2601	5.2156	
15	19.5065	13.1632	10.7649	9.4757	8.6622	8.0988	7.6840	7.3650	7.1117	6.9054	6.5892	6.2637	5.9273	5.7194	5.5780	5.3976	5.2872	5.2127	5.1374	5.0612	4.9619	4.8948	4.8508	15
16	18.8907	12.6880	10.3443	9.0844	8.2892	7.7383	7.3324	7.0203	6.7722	6.5701	6.2602	5.9409	5.6105	5.4061	5.2669	5.0891	4.9803	4.9067	4.8323	4.7570	4.6588	4.5924	4.5488	
17	18.3683	12.2862	9.9894	8.7547	7.9751	7.4348	7.0367	6.7303	6.4868	6.2883	5.9837	5.6697	5.3444	5.1429	5.0056	4.8300	4.7224	4.6496	4.5759	4.5013	4.4039	4.3380	4.2946	
18	17.9197	11.9423	9.6861	8.4732	7.7072	7.1761	6.7847	6.4833	6.2437	6.0483	5.7483	5.4388	5.1179	4.9189	4.7831	4.6094	4.5028	4.4306	4.3575	4.2835	4.1867	4.1211	4.0780	
19	17.5304	11.6446	9.4241	8.2302	7.4761	6.9531	6.5675	6.2705	6.0343	5.8416	5.5457	5.2401	4.9229	4.7260	4.5916	4.4194	4.3136	4.2420	4.1694	4.0957	3.9994	3.9341	3.8911	
20	17.1895	11.3847	9.1955	8.0185	7.2748	6.7590	6.3785	6.0853	5.8521	5.6618	5.3694	5.0673	4.7534	4.5583	4.4250	4.2541	4.1490	4.0778	4.0056	3.9323	3.8363	3.7712	3.7283	20
22	16.6211	10.9526	8.8163	7.6676	6.9416	6.4377	6.0658	5.7791	5.5509	5.3646	5.0781	4.7817	4.4732	4.2811	4.1496	3.9808	3.8768	3.8063	3.7346	3.6618	3.5662	3.5012	3.4584	
24	16.1663	10.6083	8.5147	7.3889	6.6771	6.1829	5.8180	5.5366	5.3124	5.1293	4.8475	4.5556	4.2514	4.0617	3.9316	3.7643	3.6611	3.5909	3.5196	3.4470	3.3516	3.2866	3.2437	
26	15.7944	10.3275	8.2693	7.1624	6.4623	5.9761	5.6169	5.3398	5.1189	4.9385	4.6606	4.3724	4.0716	3.8837	3.7547	3.5886	3.4859	3.4160	3.3448	3.2723	3.1769	3.1118	3.0687	
28	15.4847	10.0944	8.0658	6.9747	6.2845	5.8050	5.4506	5.1771	4.9590	4.7808	4.5061	4.2210	3.9230	3.7366	3.6084	3.4432	3.3408	3.2711	3.2001	3.1276	3.0320	2.9666	2.9233	
30	15.2228	9.8977	7.8944	6.8168	6.1350	5.6611	5.3108	5.0403	4.8246	4.6482	4.3763	4.0938	3.7982	3.6130	3.4855	3.3209	3.2188	3.1492	3.0781	3.0056	2.9097	2.8440	2.8004	30
35	14.71&67	9.5189	7.5648	6.5135	5.8480	5.3852	5.0429	4.7783	4.5672	4.3944	4.1277	3.8502	3.5590	3.3760	3.2498	3.0862	2.9844	2.9147	2.8435	2.7706	2.6738	2.6071	2.5628	
40	14.3520	9.2470	7.3287	6.2966	5.6430	5.1882	4.8516	4.5914	4.3836	4.2134	3.9505	3.6765	3.3884	3.2069	3.0814	2.9183	2.8165	2.7467	2.6752	2.6016	2.5037	2.4360	2.3908	
45	14.0768	9.0424	7.1514	6.1338	5.4893	5.0406	4.7084	4.4515	4.2461	4.0779	3.8179	3.5465	3.2607	3.0802	2.9551	2.7922	2.6903	2.6203	2.5483	2.4742	2.3751	2.3062	2.2601	
50	13.8618	8.8829	7.0133	6.0072	5.3698	4.9259	4.5972	4.3428	4.1394	3.9727	3.7149	3.4456	3.1614	2.9817	2.8569	2.6941	2.5920	2.5216	2.4492	2.3745	2.2742	2.2042	2.1571	50
60	13.5476	8.6505	6.8124	5.8232	5.1962	4.7594	4.4357	4.1851	3.9846	3.8201	3.5655	3.2992	3.0174	2.8386	2.7142	2.5512	2.4485	2.3776	2.3043	2.2283	2.1257	2.0535	2.0046	
70	13.3292	8.4894	6.6734	5.6959	5.0762	4.6444	4.3242	4.0762	3.8777	3.7148	3.4624	3.1981	2.9179	2.7397	2.6154	2.4521	2.3489	2.2774	2.2033	2.1261	2.0213	1.9471	1.8965	
80	13.1685	8.3711	6.5714	5.6026	4.9884	4.5602	4.2426	3.9965	3.7995	3.6378	3.3870	3.1241	2.8451	2.6672	2.5430	2.3794	2.2757	2.2036	2.1287	2.0505	1.9438	1.8676	1.8153	
90	13.0454	8.2806	6.4934	5.5314	4.9213	4.4959	4.1803	3.9357	3.7398	3.5790	3.3295	3.0677	2.7895	2.6119	2.4876	2.3237	2.2195	2.1469	2.0714	1.9923	1.8837	1.8057	1.7519	
100	12.9480	8.2091	6.4319	5.4751	4.8683	4.4452	4.1312	3.8877	3.6928	3.5326	3.2841	3.0232	2.7456	2.5682	2.4439	2.2797	2.1750	2.1021	2.0259	1.9459	1.8357	1.7561	1.7008	100
125	12.7753	8.0824	6.3230	5.3757	4.7748	4.3556	4.0444	3.8030	3.6097	3.4507	3.2040	2.9446	2.6681	2.4909	2.3665	2.2016	2.0960	2.0222	1.9448	1.8630	1.7493	1.6661	1.6075	
150	12.6620	7.9994	6.2516	5.3106	4.7136	4.2970	3.9876	3.7477	3.5553	3.3972	3.1516	2.8932	2.6174	2.4403	2.3158	2.1503	2.0441	1.9695	1.8912	1.8080	1.6915	1.6052	1.5437	
175	12.5819	7.9408	6.2013	5.2647	4.6704	4.2556	3.9476	3.7086	3.5170	3.3595	3.1147	2.8570	2.5816	2.4046	2.2800	2.1140	2.0073	1.9322	1.8530	1.7688	1.6500	1.5611	1.4970	
200	12.5222	7.8972	6.1639	5.2306	4.6383	4.2250	3.9179	3.6797	3.4886	3.3315	3.0873	2.8301	2.5550	2.3781	2.2533	2.0870	1.9798	1.9043	1.8245	1.7394	1.6186	1.5275	1.4611	
250	12.4394	7.8368	6.1120	5.1833	4.5939	4.1824	3.8768	3.6395	3.4492	3.2927	3.0493	2.7928	2.5182	2.3413	2.2164	2.0495	1.9417	1.8654	1.7847	1.6982	1.5744	1.4797	1.4093	250
300	12.3846	7.7968	6.0778	5.1521	4.5645	4.1543	3.8496	3.6130	3.4232	3.2671	3.0242	2.7682	2.4939	2.3170	2.1919	2.0247	1.9163	1.8396	1.7582	1.6706	1.5446	1.4470	1.3733	
350	12.3457	7.7684	6.0534	5.1299	4.5437	4.1344	3.8303	3.5942	3.4048	3.2489	3.0064	2.7507	2.4766	2.2997	2.1746	2.0070	1.8983	1.8213	1.7393	1.6509	1.5232	1.4232	1.3468	
400	12.3166	7.7472	6.0353	5.1134	4.5282	4.1195	3.8159	3.5801	3.3910	3.2353	2.9931	2.7377	2.4637	2.2868	2.1616	1.9938	1.8848	1.8075	1.7252	1.6362	1.5069	1.4051	1.3262	
450	12.2940	7.7307	6.0212	5.1006	4.5161	4.1080	3.8048	3.5693	3.3803	3.2248	2.9829	2.7276	2.4537	2.2768	2.1515	1.9835	1.8744	1.7968	1.7141	1.6246	1.4943	1.3908	1.3099	
500	12.2760	7.7176	6.0099	5.0903	4.5065	4.0988	3.7959	3.5606	3.3718	3.2164	2.9747	2.7195	2.4458	2.2688	2.1435	1.9754	1.8660	1.7883	1.7053	1.6154	1.4841	1.3793	1.2965	500
600	12.2491	7.6980	5.9931	5.0750	4.4921	4.0851	3.7826	3.5476	3.3591	3.2039	2.9624	2.7075	2.4338	2.2569	2.1315	1.9631	1.8535	1.7754	1.6921	1.6015	1.4687	1.3617	1.2758	
700	12.2299	7.6840	5.9812	5.0641	4.4819	4.0753	3.7731	3.5384	3.3500	3.1950	2.9537	2.6989	2.4254	2.2484	2.1230	1.9544	1.8446	1.7663	1.6826	1.5916	1.4576	1.3489	1.2605	
800	12.2156	7.6736	5.9722	5.0560	4.4742	4.0680	3.7660	3.5315	3.3432	3.1883	2.9471	2.6925	2.4190	2.2421	2.1166	1.9479	1.8379	1.7595	1.6756	1.5842	1.4492	1.3392	1.2487	
900	12.2044	7.6655	5.9653	5.0496	4.4683	4.0623	3.7605	3.5261	3.3380	3.1831	2.9421	2.6875	2.4141	2.2371	2.1116	1.9428	1.8327	1.7541	1.6700	1.5784	1.4427	1.3316	1.2393	
1,000	12.1955	7.6590	5.9597	5.0446	4.4635	4.0577	3.7561	3.5218	3.3338	3.1790	2.9380	2.6835	2.4101	2.2332	2.1076	1.9387	1.8285	1.7499	1.6656	1.5737	1.4375	1.3255	1.2316	1,000
2,000	12.1555	7.6299	5.9348	5.0219	4.4422	4.0374	3.7364	3.5026	3.3149	3.1604	2.9198	2.6657	2.3925	2.2155	2.0898	1.9205	1.8098	1.7307	1.6458	1.5527	1.4137	1.2972	1.1951	
3,000	12.1422	7.6202	5.9265	5.0144	4.4352	4.0306	3.7299	3.4962	3.3087	3.1543	2.9138	2.6597	2.3866	2.2096	2.0839	1.9145	1.8036	1.7243	1.6391	1.5457	1.4057	1.2875	1.1820	
4,000	12.1356	7.6154	5.9224	5.0106	4.4316	4.0272	3.7266	3.4930	3.3056	3.1512	2.9108	2.6568	2.3837	2.2067	2.0809	1.9114	1.8005	1.7211	1.6358	1.5422	1.4017	1.2826	1.1752	
5,000	12.1316	7.6125	5.9199	5.0083	4.4295	4.0252	3.7246	3.4911	3.3037	3.1493	2.9090	2.6550	2.3819	2.2049	2.0791	1.9096	1.7987	1.7192	1.6338	1.5401	1.3993	1.2796	1.1711	
7,500	12.1263	7.6086	5.9166	5.0053	4.4267	4.0225	3.7220	3.4886	3.3012	3.1469	2.9066	2.6526	2.3796	2.2026	2.0768	1.9072	1.7962	1.7167	1.6312	1.5373	1.3961	1.2756	1.1654	
10,000	12.1236	7.6067	5.9149	5.0038	4.4253	4.0212	3.7207	3.4873	3.2999	3.1457	2.9054	2.6515	2.3784	2.2014	2.0756	1.9060	1.7949	1.7154	1.6299	1.5359	1.3944	1.2736	1.1626	10,000
	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	50	60	75	100	175	350	1,000	

F_{ν_1,ν_2} .9995

W. H. Cherry