

Figure 13.13i. 99.5th PERCENTILES FOR THE F DISTRIBUTION $[F_{v_1, v_2}]$ [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 $Y \sim F_{v_1, v_2}$ such that $\Pr(Y \leq y) = 0.995$ (v_1 is the numerator, v_2 the denominator, degrees of freedom)

$\downarrow$ $v_2 \backslash v_1$	Each table entry is the value (y) of the random variable $Y \sim F_{v_1, v_2}$ such that $\Pr(Y \leq y) = 0.995$ (v_1 is the numerator, v_2 the denominator, degrees of freedom)																								
	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	50	60	75	100		175	350	1,000	
2017-02-20	1	16.211	19.999	21.615	22.500	23.056	23.437	23.715	23.925	24.091	24.224	24.426	24.630	24.836	24.960	25.044	25.148	25.211	25.253	25.295	25.337	25.392	25.428	25.452	1
	2	198.50	199.00	199.17	199.25	199.30	199.33	199.36	199.37	199.39	199.40	199.42	199.43	199.45	199.46	199.47	199.47	199.48	199.48	199.49	199.49	199.49	199.50	199.50	
	3	55.552	497.99	474.67	461.95	45.392	44.838	44.434	44.126	43.882	43.686	43.387	43.085	42.778	42.591	42.466	42.308	42.213	42.149	42.086	42.022	41.939	41.884	41.848	
	4	31.333	26.284	24.259	23.155	22.456	21.975	21.622	21.352	21.139	20.967	20.705	20.438	20.167	20.002	19.892	19.752	19.667	19.611	19.554	19.497	19.423	19.374	19.342	
	5	22.785	18.314	16.530	15.556	14.940	14.513	14.200	13.961	13.772	13.618	13.384	13.146	12.903	12.755	12.656	12.530	12.454	12.402	12.351	12.300	12.233	12.188	12.159	5
	6	18.6350	14.5441	12.9166	12.0275	11.4637	11.0730	10.7859	10.5658	10.3915	10.2500	10.0343	9.8140	9.5888	9.4511	9.3582	9.2408	9.1697	9.1219	9.0739	9.0257	8.9633	8.9214	8.8941	
	7	16.2356	12.4040	10.8824	10.0505	9.5221	9.1553	8.8854	8.6781	8.5138	8.3803	8.1764	7.9678	7.7540	7.6230	7.5345	7.4224	7.3544	7.3088	7.2628	7.2165	7.1567	7.1165	7.0902	
	8	14.6882	11.0424	9.5965	8.8051	8.3018	7.9520	7.6941	7.4959	7.3386	7.2106	7.0149	6.8143	6.6082	6.4817	6.3961	6.2875	6.2215	6.1772	6.1325	6.0875	6.0292	5.9900	5.9644	
	9	13.6136	10.1067	8.7171	7.9559	7.4712	7.1339	6.8849	6.6933	6.5411	6.4172	6.2274	6.0325	5.8318	5.7084	5.6248	5.5186	5.4539	5.4104	5.3666	5.3223	5.2650	5.2264	5.2012	
	10	12.8265	9.4270	8.0807	7.3428	6.8724	6.5446	6.3025	6.1159	5.9676	5.8467	5.6613	5.4707	5.2740	5.1528	5.0706	4.9659	4.9022	4.8592	4.8159	4.7721	4.7153	4.6771	4.6521	10
	11	12.2263	8.9122	7.6004	6.8809	6.4217	6.1016	5.8648	5.6821	5.5368	5.4183	5.2363	5.0489	4.8552	4.7356	4.6543	4.5508	4.4876	4.4450	4.4020	4.3585	4.3020	4.2640	4.2390	
	12	11.7542	8.5096	7.2258	6.5211	6.0711	5.7570	5.5245	5.3451	5.2021	5.0855	4.9062	4.7213	4.5299	4.4155	4.3309	4.2282	4.1653	4.1229	4.0801	4.0368	3.9804	3.9424	3.9174	
	13	11.3735	8.1865	6.9258	6.2335	5.7910	5.4819	5.2529	5.0761	4.9351	4.8199	4.6429	4.4600	4.2703	4.1518	4.0727	3.9704	3.9078	3.8655	3.8228	3.7795	3.7231	3.6850	3.6601	
	14	11.0603	7.9216	6.6804	5.9984	5.5623	5.2574	5.0313	4.8566	4.7173	4.6034	4.4281	4.2468	4.0585	3.9417	3.8619	3.7600	3.6975	3.6552	3.6125	3.5692	3.5127	3.4745	3.4494	
	15	10.7980	7.7008	6.4760	5.8029	5.3721	5.0708	4.8473	4.6744	4.5364	4.4235	4.2497	4.0698	3.8826	3.7662	3.6867	3.5850	3.5225	3.4803	3.4375	3.3941	3.3374	3.2991	3.2739	15
	16	10.5755	7.5138	6.3034	5.6378	5.2117	4.9134	4.6920	4.5207	4.3838	4.2719	4.0994	3.9205	3.7342	3.6182	3.5389	3.4372	3.3747	3.3324	3.2895	3.2460	3.1891	3.1506	3.1253	
	17	10.3842	7.3536	6.1556	5.4967	5.0746	4.7789	4.5594	4.3894	4.2535	4.1424	3.9709	3.7929	3.6073	3.4916	3.4124	3.3108	3.2482	3.2058	3.1628	3.1192	3.0620	3.0233	2.9978	
	18	10.2181	7.2148	6.0278	5.3746	4.9560	4.6627	4.4448	4.2759	4.1410	4.0305	3.8599	3.6827	3.4977	3.3822	3.3030	3.2014	3.1387	3.0962	3.0531	3.0093	2.9518	2.9128	2.8871	
	19	10.0725	7.0935	5.9161	5.2681	4.8526	4.5614	4.3448	4.1770	4.0428	3.9329	3.7631	3.5866	3.4020	3.2867	3.2075	3.1058	3.0430	3.0004	2.9571	2.9131	2.8554	2.8161	2.7902	
20	9.9439	6.9865	5.8177	5.1743	4.7616	4.4721	4.2569	4.0900	3.9564	3.8470	3.6779	3.5020	3.3178	3.2025	3.1234	3.0215	2.9586	2.9159	2.8724	2.8282	2.7702	2.7306	2.7046	20	
22	9.7271	6.8064	5.6524	5.0168	4.6088	4.3225	4.1094	3.9440	3.8116	3.7030	3.5350	3.3600	3.1764	3.0613	2.9821	2.8799	2.8167	2.7736	2.7298	2.6852	2.6264	2.5864	2.5599		
24	9.5513	6.6609	5.5190	4.8898	4.4857	4.2019	3.9905	3.8264	3.6949	3.5870	3.4199	3.2456	3.0624	2.9472	2.8679	2.7654	2.7018	2.6585	2.6143	2.5692	2.5098	2.4692	2.4423		
26	9.4059	6.5409	5.4091	4.7852	4.3844	4.1027	3.8928	3.7297	3.5989	3.4916	3.3252	3.1515	2.9685	2.8533	2.7738	2.6709	2.6070	2.5633	2.5188	2.4733	2.4131	2.3719	2.3446		
28	9.2838	6.4403	5.3170	4.6977	4.2996	4.0197	3.8110	3.6487	3.5186	3.4117	3.2460	3.0727	2.8899	2.7746	2.6949	2.5916	2.5273	2.4834	2.4384	2.3925	2.3316	2.2898	2.2621		
30	9.1977	6.3547	5.2388	4.6234	4.2276	3.9492	3.7416	3.5801	3.4505	3.3440	3.1787	3.0057	2.8230	2.7076	2.6278	2.5241	2.4594	2.4151	2.3699	2.3234	2.2619	2.2195	2.1914	30	
F_{v_1, v_2} .995	35	8.9763	6.1878	5.0865	4.4788	4.0876	3.8123	3.6066	3.4466	3.3180	3.2123	3.0480	2.8756	2.6930	2.5772	2.4969	2.3922	2.3266	2.2816	2.2355	2.1880	2.1248	2.0810	2.0518	F_{v_1, v_2} .995
	40	8.8279	6.0664	4.9758	4.3738	3.9860	3.7129	3.5088	3.3498	3.2220	3.1167	2.9531	2.7811	2.5984	2.4823	2.4015	2.2958	2.2295	2.1838	2.1369	2.0884	2.0236	1.9785	1.9483	
	45	8.7148	5.9741	4.8918	4.2941	3.9090	3.6376	3.4346	3.2764	3.1492	3.0443	2.8811	2.7094	2.5266	2.4101	2.3288	2.2224	2.1553	2.1090	2.0613	2.0119	1.9456	1.8993	1.8682	
	50	8.6258	5.9016	4.8259	4.2316	3.8486	3.5785	3.3765	3.2189	3.0920	2.9875	2.8247	2.6531	2.4702	2.3533	2.2717	2.1644	2.0967	2.0499	2.0015	1.9512	1.8836	1.8361	1.8040	50
	60	8.4946	5.7950	4.7290	4.1399	3.7599	3.4918	3.2911	3.1344	3.0083	2.9042	2.7419	2.5705	2.3872	2.2697	2.1874	2.0789	2.0100	1.9622	1.9126	1.8609	1.7907	1.7410	1.7073	
	70	8.4027	5.7204	4.6613	4.0758	3.6980	3.4313	3.2315	3.0755	2.9498	2.8460	2.6840	2.5127	2.3291	2.2112	2.1283	2.0186	1.9488	1.9002	1.8496	1.7966	1.7242	1.6726	1.6373	
	80	8.3346	5.6652	4.6113	4.0285	3.6524	3.3867	3.1876	3.0320	2.9066	2.8031	2.6413	2.4700	2.2862	2.1678	2.0845	1.9739	1.9033	1.8540	1.8025	1.7484	1.6742	1.6208	1.5840	
	90	8.2822	5.6228	4.5728	3.9922	3.6173	3.3524	3.1538	2.9986	2.8735	2.7701	2.6085	2.4373	2.2532	2.1345	2.0507	1.9394	1.8681	1.8182	1.7660	1.7109	1.6350	1.5800	1.5419	
	100	8.2406	5.5892	4.5424	3.9634	3.5895	3.3252	3.1271	2.9722	2.8472	2.7440	2.5825	2.4113	2.2270	2.1080	2.0239	1.9119	1.8400	1.7896	1.7367	1.6809	1.6034	1.5470	1.5076	100
	125	8.1665	5.5294	4.4882	3.9122	3.5400	3.2769	3.0796	2.9252	2.8006	2.6975	2.5363	2.3651	2.1804	2.0607	1.9760	1.8628	1.7897	1.7383	1.6841	1.6266	1.5459	1.4864	1.44	

Figure 13.13j. 99.9th PERCENTILES FOR THE F DISTRIBUTION $[F_{v_1, v_2}]$

[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]

df ↓ v ₂ / v ₁	Each table entry is the value (y) of the random variable $Y \sim F_{v_1, v_2}$ such that $\Pr(Y \leq y) = 0.999$ (v ₁ is the numerator, v ₂ the denominator, degrees of freedom)																								
	1	2	3	4	5	6	7	8	9	10	12	15	20	25	30	40	50	60	75	100	175	350	1,000		
2017-02-20	1	405.284	499.999	540.379	562.500	576.405	585.937	592.873	598.144	602.284	605.621	610.668	615.764	620.908	624.017	626.099	628.712	630.285	631.337	632.390	633.444	634.803	635.711	636.301	1
	2	998.50	999.00	999.17	999.25	999.30	999.33	999.36	999.37	999.39	999.40	999.42	999.43	999.45	999.46	999.47	999.47	999.48	999.48	999.49	999.49	999.49	999.50	999.50	
	3	167.03	148.50	141.11	137.10	134.58	132.85	131.58	130.62	129.86	129.25	128.32	127.37	126.42	125.84	125.45	124.96	124.66	124.47	124.27	124.07	123.81	123.64	123.53	
	4	74.137	61.246	56.177	53.436	51.712	50.525	49.658	48.996	48.475	48.053	47.412	46.761	46.100	45.699	45.429	45.089	44.883	44.746	44.608	44.469	44.290	44.171	44.093	
	5	47.181	37.122	33.202	31.085	29.752	28.834	28.163	27.649	27.244	26.917	26.418	25.911	25.395	25.080	24.869	24.602	24.441	24.333	24.224	24.115	23.974	23.880	23.819	5
	6	35.507	27.000	23.703	21.924	20.803	20.030	19.463	19.030	18.688	18.411	17.989	17.559	17.120	16.853	16.672	16.445	16.307	16.214	16.121	16.028	15.907	15.826	15.774	
	7	29.245	21.689	18.772	17.198	16.206	15.521	15.019	14.634	14.330	14.083	13.707	13.324	12.932	12.692	12.530	12.326	12.202	12.119	12.035	11.951	11.842	11.769	11.722	
	8	25.4148	18.4937	15.8295	14.3916	13.4847	12.8580	12.3980	12.0455	11.7665	11.5401	11.1945	10.8413	10.4797	10.2583	10.1087	9.9194	9.8044	9.7272	9.6495	9.5714	9.4701	9.4021	9.3577	
	9	22.8571	16.3871	13.9018	12.5603	11.7137	11.1281	10.6979	10.3680	10.1066	9.8943	9.5700	9.2381	8.8976	8.6888	8.5476	8.3685	8.2597	8.1865	8.1129	8.0387	7.9425	7.8779	7.8357	
	10	21.0396	14.9054	12.5527	11.2828	10.4807	9.9256	9.5175	9.2041	8.9558	8.7539	8.4452	8.1288	7.8037	7.6041	7.4688	7.2971	7.1927	7.1224	7.0516	6.9802	6.8876	6.8253	6.7845	10
F _{v₁, v₂} .999	11	19.6868	13.8116	11.5611	10.3461	9.5784	9.0466	8.6553	8.3548	8.1163	7.9224	7.6256	7.3210	7.0076	6.8147	6.6839	6.5178	6.4165	6.3483	6.2795	6.2102	6.1201	6.0595	6.0198	
	12	18.6433	12.9737	10.8042	9.6327	8.8921	8.3788	8.0009	7.7104	7.4797	7.2920	7.0046	6.7092	6.4048	6.2172	6.0898	5.9278	5.8290	5.7623	5.6951	5.6272	5.5390	5.4795	5.4406	
	13	17.8154	12.3127	10.2089	9.0727	8.3541	7.8557	7.4886	7.2061	6.9818	6.7992	6.5192	6.2312	5.9340	5.7505	5.6258	5.4670	5.3700	5.3046	5.2385	5.1718	5.0849	5.0263	4.9879	
	14	17.1434	11.7789	9.7294	8.6223	7.9218	7.4358	7.0775	6.8017	6.5826	6.4041	6.1302	5.8483	5.5568	5.3767	5.2542	5.0979	5.0023	4.9378	4.8726	4.8067	4.7208	4.6629	4.6248	
	15	16.5874	11.3391	9.3353	8.2527	7.5674	7.0917	6.7408	6.4707	6.2559	6.0808	5.8121	5.5351	5.2484	5.0710	4.9502	4.7959	4.7015	4.6377	4.5732	4.5079	4.4228	4.3652	4.3275	15
	16	16.1202	10.9710	9.0059	7.9442	7.2719	6.8049	6.4604	6.1950	5.9839	5.8117	5.5473	5.2745	4.9918	4.8167	4.6972	4.5446	4.4511	4.3878	4.3238	4.2590	4.1744	4.1172	4.0796	
	17	15.7222	10.6584	8.7269	7.6831	7.0219	6.5625	6.2234	5.9620	5.7541	5.5844	5.3237	5.0544	4.7751	4.6019	4.4836	4.3323	4.2395	4.1767	4.1131	4.0486	3.9644	3.9074	3.8699	
	18	15.3793	10.3899	8.4875	7.4593	6.8078	6.3550	6.0206	5.7628	5.5575	5.3900	5.1324	4.8663	4.5899	4.4182	4.3009	4.1507	4.0584	3.9960	3.9327	3.8685	3.7845	3.7276	3.6901	
	19	15.0808	10.1568	8.2799	7.2655	6.6225	6.1754	5.8452	5.5904	5.3876	5.2219	4.9672	4.7037	4.4297	4.2594	4.1429	3.9936	3.9018	3.8396	3.7765	3.7125	3.6287	3.5718	3.5344	
	20	14.8188	9.9526	8.0984	7.0960	6.4606	6.0186	5.6920	5.4400	5.2392	5.0752	4.8229	4.5618	4.2900	4.1208	4.0050	3.8564	3.7650	3.7030	3.6401	3.5762	3.4925	3.4356	3.3981	20
F _{v₁, v₂} .999	22	14.3803	9.6120	7.7960	6.8142	6.1914	5.7580	5.4376	5.1901	4.9929	4.8317	4.5835	4.3262	4.0579	3.8906	3.7759	3.6285	3.5376	3.4759	3.4131	3.3493	3.2656	3.2086	3.1710	
	24	14.0280	9.3394	7.5545	6.5892	5.9768	5.5504	5.2349	4.9912	4.7968	4.6379	4.3929	4.1387	3.8732	3.7073	3.5935	3.4468	3.3562	3.2946	3.2320	3.1681	3.0842	3.0269	2.9891	
	26	13.7390	9.1163	7.3572	6.4057	5.8018	5.3812	5.0698	4.8292	4.6372	4.4801	4.2378	3.9861	3.7228	3.5580	3.4448	3.2987	3.2083	3.1467	3.0840	3.0200	2.9357	2.8782	2.8401	
	28	13.4976	8.9305	7.1931	6.2532	5.6565	5.2407	4.9328	4.6947	4.5047	4.3491	4.1091	3.8595	3.5980	3.4341	3.3213	3.1755	3.0852	3.0236	2.9608	2.8967	2.8120	2.7540	2.7156	
	30	13.2930	8.7734	7.0545	6.1245	5.5339	5.1223	4.8173	4.5814	4.3930	4.2388	4.0006	3.7527	3.4928	3.3296	3.2171	3.0716	2.9813	2.9196	2.8567	2.7923	2.7072	2.6488	2.6100	30
	35	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	
	40	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	
	45	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	
	50	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	50
	60	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	
70	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		
80	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		
90	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		
100	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	100	
STAT 221 – W.H. Cherry	125	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.											