Tukey's Q Table — Studentized Range Critical Values

Significance Level: α = 0.01 | 99% Confidence | k = 2–10 Groups | Within-Group df = 1–∞

Source: StatisticsFundamentals.com | statisticsfundamentals.com/tables/tukeys-q-table/ | **Derived from:** Tukey, J. W. (1949). Biometrics, 5(2), 99–114. doi:10.2307/3001913 | NIST/SEMATECH e-Handbook of Statistical Methods, itl.nist.gov | Penn State STAT 503, online.stat.psu.edu | Abdi & Williams (2010), Encyclopedia of Research Design, SAGE

HSD = q(α, k, df) × √(MSE / n) | df = N − k | Reject H■ for pair (i,j) if |■_i − ■_j| > HSD | Use α = 0.01 for high-stakes or clinical research

df \ k	k = 2	k = 3	k = 4	k = 5	k = 6	k = 7	k = 8	k = 9	k = 10
1	90.03	135.00	164.30	185.60	202.20	215.80	227.30	237.00	245.60
2	14.04	19.02	22.29	24.72	26.63	28.20	29.53	30.68	31.69
3	8.26	10.62	12.17	13.33	14.24	15.00	15.64	16.20	16.69
4	6.51	8.12	9.17	9.96	10.58	11.10	11.55	11.93	12.27
5	5.70	6.98	7.80	8.42	8.91	9.32	9.67	9.97	10.24
6	5.24	6.33	7.03	7.56	7.97	8.32	8.61	8.87	9.10
7	4.95	5.92	6.54	7.01	7.37	7.68	7.94	8.17	8.37
8	4.75	5.64	6.20	6.62	6.96	7.24	7.47	7.68	7.86
9	4.60	5.43	5.96	6.35	6.66	6.91	7.13	7.33	7.49
10	4.48	5.27	5.77	6.14	6.43	6.67	6.87	7.05	7.21
11	4.39	5.15	5.62	5.97	6.25	6.48	6.67	6.84	6.99
12	4.32	5.05	5.50	5.84	6.10	6.32	6.51	6.67	6.81
13	4.26	4.96	5.40	5.73	5.98	6.19	6.37	6.53	6.67
14	4.21	4.89	5.32	5.63	5.88	6.08	6.26	6.41	6.54
15	4.17	4.84	5.25	5.56	5.80	5.99	6.16	6.31	6.44
16	4.13	4.79	5.19	5.49	5.72	5.92	6.08	6.22	6.35
17	4.10	4.74	5.14	5.43	5.66	5.85	6.01	6.15	6.27
18	4.07	4.70	5.09	5.38	5.60	5.79	5.94	6.08	6.20
19	4.05	4.67	5.05	5.33	5.55	5.73	5.89	6.02	6.14
20	4.02	4.64	5.02	5.29	5.51	5.69	5.84	5.97	6.09

df \ k	k = 2	k = 3	k = 4	k = 5	k = 6	k = 7	k = 8	k = 9	k = 10
24	3.96	4.55	4.91	5.17	5.37	5.54	5.69	5.81	5.92
30	3.89	4.45	4.80	5.05	5.24	5.40	5.54	5.65	5.76
40	3.82	4.37	4.70	4.93	5.11	5.26	5.39	5.50	5.60
60	3.76	4.28	4.59	4.82	4.99	5.13	5.25	5.36	5.45
120	3.70	4.20	4.50	4.71	4.87	5.01	5.12	5.21	5.30
∞	3.64	4.12	4.40	4.60	4.76	4.88	4.99	5.08	5.16

■ ***When to use* α *= 0.01:*** *Choose the 99% confidence table when false positives carry high consequences — such as clinical trials, pharmaceutical dose comparisons, or confirmatory research. Critical q values at α = 0.01 are larger than at α = 0.05, requiring a wider mean difference to declare significance. For standard exploratory research, use the α = 0.05 table.*

Most Commonly Used Values (α = 0.01)

Parameters	q (α=0.01)
k=3, df=10	10.62
k=4, df=20	5.02
k=5, df=20	5.29
k=4, df=30	4.80
k=3, df=20	4.64
k=5, df=30	5.05

Keywords: Tukey Q table 0.01 | Studentized range distribution 99 percent | Tukey HSD alpha 0.01 | post-hoc ANOVA critical values | pairwise comparisons | family-wise error rate | FWER | k groups | within-group degrees of freedom | MSE | multiple comparisons | Bonferroni | Scheffe | statistics | statisticsfundamentals.com | alpha = 0.01 | 99% confidence