

Critical Values for the Rejection Quotient, Q (Dixon Q -Test)
 from D. B. Rorabacher, *Anal Chem*, **63**, 139 (1991)

N	80%	90%	95%	96%	98%	99%
3	0.886	0.941	0.970	0.976	0.988	0.994
4	0.679	0.765	0.829	0.846	0.889	0.926
5	0.557	0.642	0.710	0.729	0.780	0.821
6	0.482	0.560	0.625	0.644	0.698	0.740
7	0.434	0.507	0.568	0.586	0.637	0.680
8	0.399	0.468	0.526	0.543	0.590	0.634
9	0.370	0.437	0.493	0.510	0.555	0.598
10	0.349	0.412	0.466	0.483	0.527	0.568
11	0.332	0.392	0.444	0.460	0.502	0.542
12	0.318	0.376	0.426	0.441	0.482	0.522
13	0.305	0.361	0.410	0.425	0.465	0.503
14	0.294	0.349	0.396	0.411	0.450	0.488
15	0.285	0.338	0.384	0.399	0.438	0.475
16	0.277	0.329	0.374	0.388	0.426	0.463
17	0.269	0.320	0.365	0.379	0.416	0.452
18	0.263	0.313	0.356	0.370	0.407	0.442
19	0.258	0.306	0.349	0.363	0.398	0.433
20	0.252	0.300	0.342	0.356	0.391	0.425
21	0.247	0.295	0.337	0.350	0.384	0.418
22	0.242	0.290	0.331	0.344	0.378	0.411
23	0.238	0.285	0.326	0.338	0.372	0.404
24	0.234	0.281	0.321	0.333	0.367	0.399
25	0.230	0.277	0.317	0.329	0.362	0.393
26	0.227	0.273	0.312	0.324	0.357	0.388
27	0.224	0.269	0.308	0.320	0.353	0.384
28	0.220	0.266	0.305	0.316	0.349	0.380
29	0.218	0.263	0.301	0.312	0.345	0.376
30	0.215	0.260	0.298	0.309	0.341	0.372

For a sample of N measurements, a value can be rejected with a particular degree of confidence if the absolute value of the difference between the questionable value and its nearest neighbor divided by the spread (range) of the entire data set is greater than the particular critical Q chosen.

Ex: The measurement of the density of a certain mineral yielded 3.456, 3.451, 3.475, and 3.452 g/cm³. Should the 3.475 value be retained or rejected at the 90% confidence level?

$$Q_{\text{exp}} = |3.475 - 3.456| / (3.475 - 3.451) = 0.792$$

At 90% confidence level, with 4 measurements, $Q_{\text{crit}} = 0.765$ which is smaller than $Q_{\text{exp}} = 0.792$. Therefore the questionable data 3.475 can be rejected at 90% confidence level. But it can be retained at 95% confidence level since $Q_{\text{exp}}(0.792) < Q_{\text{crit}}(0.829)$.