

What is the value of Z Alpha/2, also known as $z_{\alpha/2}$?

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Z Alpha/2, also known as $z_{\alpha/2}$, is a critical value used in statistical calculations. It is the value that divides the area under the standard normal curve into two equal parts, with one area equal to $\alpha/2$ on each side. In other words, it represents the point at which the cumulative probability is equal to $\alpha/2$. This value is commonly used in hypothesis testing and confidence interval calculations to determine the critical region and the margin of error. It is an important parameter in statistical analysis as it helps to determine the significance of results and make informed decisions.

Find Z Alpha/2 ($z_{\alpha/2}$)

Whenever you come across the term $z_{\alpha/2}$ in statistics, it is simply referring to the z critical value from the z table that corresponds to $\alpha/2$.

This tutorial explains the following:

How to find $z_{\alpha/2}$ using a z table. How to find $z_{\alpha/2}$ using a calculator. The most common values for $z_{\alpha/2}$.

Let's jump in!

How to find $z_{\alpha/2}$ using a z table

Suppose we want to find $z_{\alpha/2}$ for some test that is using a 90% confidence level.

In this case, α would be $1 - 0.9 = 0.1$. Thus, $\alpha/2 = 0.1/2 = 0.05$.

To find the corresponding z critical value, we would

simply look for 0.05 in a z table:

z	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
-3.0	0.0013	0.0013	0.0013	0.0012	0.0012	0.0011	0.0011	0.0011	0.0010	0.0010
-2.9	0.0019	0.0018	0.0018	0.0017	0.0016	0.0016	0.0015	0.0015	0.0014	0.0014
-2.8	0.0026	0.0025	0.0024	0.0023	0.0023	0.0022	0.0021	0.0021	0.0020	0.0019
-2.7	0.0035	0.0034	0.0033	0.0032	0.0031	0.0030	0.0029	0.0028	0.0027	0.0026
-2.6	0.0047	0.0045	0.0044	0.0043	0.0041	0.0040	0.0039	0.0038	0.0037	0.0036
-2.5	0.0062	0.0060	0.0059	0.0057	0.0055	0.0054	0.0052	0.0051	0.0049	0.0048
-2.4	0.0082	0.0080	0.0078	0.0075	0.0073	0.0071	0.0069	0.0068	0.0066	0.0064
-2.3	0.0107	0.0104	0.0102	0.0099	0.0096	0.0094	0.0091	0.0089	0.0087	0.0084
-2.2	0.0139	0.0136	0.0132	0.0129	0.0125	0.0122	0.0119	0.0116	0.0113	0.0110
-2.1	0.0179	0.0174	0.0170	0.0166	0.0162	0.0158	0.0154	0.0150	0.0146	0.0143
-2.0	0.0228	0.0222	0.0217	0.0212	0.0207	0.0202	0.0197	0.0192	0.0188	0.0183
-1.9	0.0287	0.0281	0.0274	0.0268	0.0262	0.0256	0.0250	0.0244	0.0239	0.0233
-1.8	0.0359	0.0351	0.0344	0.0336	0.0329	0.0322	0.0314	0.0307	0.0301	0.0294
-1.7	0.0446	0.0436	0.0427	0.0418	0.0409	0.0401	0.0392	0.0384	0.0375	0.0367
-1.6	0.0548	0.0537	0.0526	0.0516	0.0505	0.0495	0.0485	0.0475	0.0465	0.0455
-1.5	0.0668	0.0655	0.0643	0.0630	0.0618	0.0606	0.0594	0.0582	0.0571	0.0559
-1.4	0.0808	0.0793	0.0778	0.0764	0.0749	0.0735	0.0721	0.0708	0.0694	0.0681
-1.3	0.0968	0.0951	0.0934	0.0918	0.0901	0.0885	0.0869	0.0853	0.0838	0.0823
-1.2	0.1151	0.1131	0.1112	0.1093	0.1075	0.1056	0.1038	0.1020	0.1003	0.0985
-1.1	0.1357	0.1335	0.1314	0.1292	0.1271	0.1251	0.1230	0.1210	0.1190	0.1170
-1.0	0.1587	0.1562	0.1539	0.1515	0.1492	0.1469	0.1446	0.1423	0.1401	0.1379
-0.9	0.1841	0.1814	0.1788	0.1762	0.1736	0.1711	0.1685	0.1660	0.1635	0.1611
-0.8	0.2119	0.2090	0.2061	0.2033	0.2005	0.1977	0.1949	0.1922	0.1894	0.1867
-0.7	0.2420	0.2389	0.2358	0.2327	0.2296	0.2266	0.2236	0.2206	0.2177	0.2148
-0.6	0.2743	0.2709	0.2676	0.2643	0.2611	0.2578	0.2546	0.2514	0.2483	0.2451
-0.5	0.3085	0.3050	0.3015	0.2981	0.2946	0.2912	0.2877	0.2843	0.2810	0.2776
-0.4	0.3446	0.3409	0.3372	0.3336	0.3300	0.3264	0.3228	0.3192	0.3156	0.3121
-0.3	0.3821	0.3783	0.3745	0.3707	0.3669	0.3632	0.3594	0.3557	0.3520	0.3483
-0.2	0.4207	0.4168	0.4129	0.4090	0.4052	0.4013	0.3974	0.3936	0.3897	0.3859
-0.1	0.4602	0.4562	0.4522	0.4483	0.4443	0.4404	0.4364	0.4325	0.4286	0.4247
-0.0	0.5000	0.4960	0.4920	0.4880	0.4840	0.4801	0.4761	0.4721	0.4681	0.4641

Notice that the exact value of 0.05 doesn't appear in the table, but it would be directly between the values .0505 and .0495. The corresponding z critical values on the outside of the table are -1.64 and -1.65.

By splitting the difference, we see that the z critical value would be **-1.645**. And typically when we use $z_{\alpha/2}$ we take the absolute value. Thus, $z_{.01/2} = 1.645$.

How to find $z_{\alpha/2}$ using a calculator

We can also use a Critical Z Value Calculator to find $z_{\alpha/2}$ for some test.

For example, for some test that is using a 90% confidence level we can simply enter 0.1 as the significance level and the calculator will automatically return the value of 1.645 as the corresponding critical z value:

Significance level

.10

CALCULATE

z critical value (right-tailed): **1.282**

z critical value (two-tailed): +/- **1.645**

Common Values for $z_{\alpha/2}$

The following table displays the most common critical values for different values of α :

α	$\alpha/2$	$Z_{\alpha/2}$
0.1	0.05	1.645
0.05	0.025	1.96
0.025	0.0125	2.241
0.01	0.005	2.576
0.005	0.0025	2.807

The way to interpret this table is as follows:

For a test using a 90% confidence level (e.g. $\alpha = 0.1$), the z critical value is 1.645. For a test using a 95% confidence level (e.g. $\alpha = 0.05$), the z critical value is 1.96. For a test using a 99% confidence level (e.g. $\alpha = 0.01$), the z critical value is 2.576.

And so on.

How to use the Z Table (With Examples)

How to Find the Z Critical Value on a TI-84 Calculator