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O APRIL 20, 2020 BY ZACH

How to use the Z Table (With Examples)

certain z-score in a standard normal distribution.

A z-table is a table that tells you what percentage of values fall below a

data value falls from the mean. It is calculated as:

A z-score simply tells you how many standard deviations away an individual

z-score = $(x - \mu) / \sigma$

where:

- x: individual data value μ: population mean
- σ: population standard deviation

Example 1

This tutorial shows several examples of how to use the z table.

The scores on a certain college entrance exam are normally distributed with mean $\mu = 82$ and standard deviation $\sigma = 8$. Approximately what percentage of

students score less than 84 on the exam? Step 1: Find the z-score.

First, we will find the z-score associated with an exam score of 84:

z-score = $(x - \mu) / \sigma = (84 - 82) / 8 = 2 / 8 = 0.25$

Step 2: Use the z-table to find the percentage that corresponds to the z-score.

Next, we will look up the value **0.25** in the z-table:

0.04

0.05

0.06

0.5239

0.5636

0.6026

0.07

0.5279

0.5675

0.6064

0.07

0.0011

0.0015

0.0021

0.0028

0.0038

0.08

0.0010

0.0014

0.0020

0.0027

0.0037

0.09

0.0010 0.0014

0.0019

0.0026

0.0036

0.06

0.0011

0.0015

0.0021

0.0029

0.0039

0.08

0.5319

0.5714

0.6103

0.09

0.5359

0.5753

0.6141

0.03

0.5040 0.5080 0.5120 0.5160 0.5199 0.5000 0.5478 0.5517 0.5557 0.5596 0.5398 0.5438 0.5948 0.5793 0.5832 0.5871 0.5910 0.5987

0.02

0.01

0.3	0.6179	0.6217	0.6255	0.6293	0.6331	0.6368	0.6406	0.6443	0.6480	0.6517
0.4	0.6554	0.6591	0.6628	0.6664	0.6700	0.6736	0.6772	0.6808	0.6844	0.6879
0.5	0.6915	0.6950	0.6985	0.7019	0.7054	0.7088	0.7123	0.7157	0.7190	0.7224
0.6	0.7257	0.7291	0.7324	0.7357	0.7389	0.7422	0.7454	0.7486	0.7517	0.7549
0.7	0.7580	0.7611	0.7642	0.7673	0.7704	0.7734	0.7764	0.7794	0.7823	0.7852
0.8	0.7881	0.7910	0.7939	0.7967	0.7995	0.8023	0.8051	0.8078	0.8106	0.8133
0.9	0.8159	0.8186	0.8212	0.8238	0.8264	0.8289	0.8315	0.8340	0.8365	0.8389
1.0	0.8413	0.8438	0.8461	0.8485	0.8508	0.8531	0.8554	0.8577	0.8599	0.8621
1.1	0.8643	0.8665	0.8686	0.8708	0.8729	0.8749	0.8770	0.8790	0.8810	0.8830
1.2	0.8849	0.8869	0.8888	0.8907	0.8925	0.8944	0.8962	0.8980	0.8997	0.9015
1.3	0.9032	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
1.4	0.9192	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
1.5	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.9545
Approximate	ely 59.	87% c	of stud	ents s	score l	ess th	ıan 84	on th	is exa	m.

what percentage of plants are greater than 26 inches tall?

The height of plants in a certain garden are normally distributed with a mean of $\mu = 26.5$ inches and a standard deviation of $\sigma = 2.5$ inches. Approximately

z-score.

Example 2

Step 1: Find the z-score.

z-score = $(x - \mu) / \sigma = (26 - 26.5) / 2.5 = -0.5 / 2.5 = -0.2$

-3.0 | 0.0013

0.0047

Step 2: Use the z-table to find the percentage that corresponds to the

0.03

0.0012

0.0043

0.04

0.0012

0.0041

0.05

0.0011

0.0040

First, we will find the z-score associated with a height of 26 inches.

0.02

0.0013

0.0044

0.0019 0.0018 0.0018 0.0017 0.0016 0.0016 0.0026 0.0025 0.0024 0.0023 0.0023 0.0022 -2.8 -2.7 0.0035 0.0034 0.0033 0.0032 0.0031 0.0030

0.01

0.0013

0.0045

Next, we will look up the value **-0.2** in the z-table:

-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	
We see that	42.07	% of v	alues	fall be	elow a	z-sco	re of -	0.2. F	lowev	er, in t	his
example we	want t	o kno	w wha	t perc	entag	e of v	alues	are <i>gr</i>	reater	than -(0.2,
which we ca	n find	by usi	ng the	form	ula 10	0% –	42.07	% = 5	7.93%	, o.	

Example 3 The weight of a certain species of dolphin is normally distributed with a mean

of $\mu = 400$ pounds and a standard deviation of $\sigma = 25$ pounds. Approximately

what percentage of dolphins weigh between 410 and 425 pounds?

z-score of 410 = $(x - \mu) / \sigma = (410 - 400) / 25 = 10 / 25 = 0.4$

Thus, aproximately 59.87% of the plants in this garden are greater than 26

Step 1: Find the z-scores. First, we will find the z-scores associated with 410 pounds and 425 pounds

z-score.

inches tall.

z-score of $425 = (x - \mu) / \sigma = (425 - 400) / 25 = 25 / 25 = 1$

Step 2: Use the z-table to find the percentages that corresponds to each

0.5948

0.6331

0.6700

0.7054

0.7389

0.7704

0.7995

0.8264

0.8508

0.8729

0.8925

0.5987

0.6368

0.6736

0.7088

0.7422

0.7734

0.8023

0.8289

0.8531

0.8749

0.8944

0.6026

0.6406

0.6772

0.7123

0.7454

0.7764

0.8051

0.8315

0.8554

0.8770

0.8962

0.6064

0.6443

0.6808

0.7157

0.7486

0.7794

0.8078

0.8340

0.8577

0.8790

0.8980

0.08

0.5319

0.5714

0.6103

0.6480

0.6844

0.7190

0.7517

0.7823

0.8106

0.8365

0.8599

0.8810

0.8997

0.09

0.5359

0.5753

0.6141

0.6517

0.6879

0.7224

0.7549

0.7852

0.8133

0.8389

0.8621

0.8830

0.9015

0.02 0.04 0.06 0.07 0.01 0.03 0.05 0.5000 0.5040 0.5080 0.5120 0.5160 0.5239 0.0 0.5199 0.5279 0.5438 0.5478 0.5517 0.5557 0.1 0.5398 0.5596 0.5636 0.5675

0.5910

0.6293

0.6664

0.7019

0.7357

0.7673

0.7967

0.8238

0.8485

0.8708

0.8907

0.5871

0.6255

0.6628

0.6985

0.7324

0.7642

0.7939

0.8212

0.8461

0.8686

0.8888

First, we will look up the value **0.4** in the z-table:

0.5832

0.6217

0.6591

0.6950

0.7291

0.7611

0.7910

0.8186

0.8438

0.8665

0.8869

0.5793

0.6179

0.6554

0.6915

0.7257

0.7580

0.7881

0.8159

0.8413

0.8643

0.8849

0.8643

0.8849

0.9032

0.9192

0.9332

0.9452

0.9554

0.9641

Additional Resources

An Introduction to the Normal Distribution

1.1

1.2

1.8

0.2

0.5

0.6

0.8

0.9

1.0

1.3 1.4 1.5	0.9032 0.9192	0.9049	0.9066	0.9082	0.9099	0.9115	0.9131	0.9147	0.9162	0.9177
	0.9192									
1.5	0.5252	0.9207	0.9222	0.9236	0.9251	0.9265	0.9279	0.9292	0.9306	0.9319
	0.9332	0.9345	0.9357	0.9370	0.9382	0.9394	0.9406	0.9418	0.9429	0.9441
1.6	0.9452	0.9463	0.9474	0.9484	0.9495	0.9505	0.9515	0.9525	0.9535	0.954
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.963
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.970
z	0	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
z 0.0	0.5000	0.01 0.5040	0.02 0.5080	0.03 0.5120	0.04 0.5160	0.05 0.5199	0.06 0.5239	0.07 0.5279	0.08 0.5319	
										0.535
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.535
0.0	0.5000 0.5398	0.5040 0.5438	0.5080 0.5478	0.5120 0.5517	0.5160 0.5557	0.5199 0.5596	0.5239 0.5636	0.5279 0.5675	0.5319 0.5714	0.5359 0.5753 0.6143
0.0 0.1 0.2	0.5000 0.5398 0.5793	0.5040 0.5438 0.5832	0.5080 0.5478 0.5871	0.5120 0.5517 0.5910	0.5160 0.5557 0.5948	0.5199 0.5596 0.5987	0.5239 0.5636 0.6026	0.5279 0.5675 0.6064	0.5319 0.5714 0.6103	0.5359 0.5753 0.6143 0.6513
0.0 0.1 0.2 0.3	0.5000 0.5398 0.5793 0.6179	0.5040 0.5438 0.5832 0.6217	0.5080 0.5478 0.5871 0.6255	0.5120 0.5517 0.5910 0.6293	0.5160 0.5557 0.5948 0.6331	0.5199 0.5596 0.5987 0.6368	0.5239 0.5636 0.6026 0.6406	0.5279 0.5675 0.6064 0.6443	0.5319 0.5714 0.6103 0.6480	0.5359 0.5753 0.6143 0.6513 0.6879
0.0 0.1 0.2 0.3 0.4	0.5000 0.5398 0.5793 0.6179 0.6554	0.5040 0.5438 0.5832 0.6217 0.6591	0.5080 0.5478 0.5871 0.6255 0.6628	0.5120 0.5517 0.5910 0.6293 0.6664	0.5160 0.5557 0.5948 0.6331 0.6700	0.5199 0.5596 0.5987 0.6368 0.6736	0.5239 0.5636 0.6026 0.6406 0.6772	0.5279 0.5675 0.6064 0.6443 0.6808	0.5319 0.5714 0.6103 0.6480 0.6844	0.535 0.575 0.614 0.651 0.687 0.7224
0.0 0.1 0.2 0.3 0.4 0.5	0.5000 0.5398 0.5793 0.6179 0.6554 0.6915	0.5040 0.5438 0.5832 0.6217 0.6591 0.6950	0.5080 0.5478 0.5871 0.6255 0.6628 0.6985	0.5120 0.5517 0.5910 0.6293 0.6664 0.7019	0.5160 0.5557 0.5948 0.6331 0.6700 0.7054	0.5199 0.5596 0.5987 0.6368 0.6736 0.7088	0.5239 0.5636 0.6026 0.6406 0.6772 0.7123	0.5279 0.5675 0.6064 0.6443 0.6808 0.7157	0.5319 0.5714 0.6103 0.6480 0.6844 0.7190	0.5359 0.5753 0.6143 0.6513 0.6879 0.7224 0.7549
0.0 0.1 0.2 0.3 0.4 0.5	0.5000 0.5398 0.5793 0.6179 0.6554 0.6915 0.7257	0.5040 0.5438 0.5832 0.6217 0.6591 0.6950 0.7291	0.5080 0.5478 0.5871 0.6255 0.6628 0.6985 0.7324	0.5120 0.5517 0.5910 0.6293 0.6664 0.7019 0.7357	0.5160 0.5557 0.5948 0.6331 0.6700 0.7054 0.7389	0.5199 0.5596 0.5987 0.6368 0.6736 0.7088 0.7422	0.5239 0.5636 0.6026 0.6406 0.6772 0.7123 0.7454	0.5279 0.5675 0.6064 0.6443 0.6808 0.7157 0.7486	0.5319 0.5714 0.6103 0.6480 0.6844 0.7190 0.7517	0.09 0.5359 0.5753 0.6143 0.6513 0.6879 0.7224 0.7549 0.7853
0.0 0.1 0.2 0.3 0.4 0.5 0.6	0.5000 0.5398 0.5793 0.6179 0.6554 0.6915 0.7257 0.7580	0.5040 0.5438 0.5832 0.6217 0.6591 0.6950 0.7291 0.7611	0.5080 0.5478 0.5871 0.6255 0.6628 0.6985 0.7324 0.7642	0.5120 0.5517 0.5910 0.6293 0.6664 0.7019 0.7357 0.7673	0.5160 0.5557 0.5948 0.6331 0.6700 0.7054 0.7389 0.7704	0.5199 0.5596 0.5987 0.6368 0.6736 0.7088 0.7422 0.7734	0.5239 0.5636 0.6026 0.6406 0.6772 0.7123 0.7454 0.7764	0.5279 0.5675 0.6064 0.6443 0.6808 0.7157 0.7486 0.7794	0.5319 0.5714 0.6103 0.6480 0.6844 0.7190 0.7517 0.7823	0.5359 0.5753 0.6143 0.6513 0.6879 0.7224 0.7549

Lastly, we will subtract the smaller value from the larger value: 0.8413 -0.6554 = 0.1859.

0.8665

0.8869

0.9049

0.9207

0.9345

0.9463

0.9564

0.9649

0.8686

0.8888

0.9066

0.9222

0.9357

0.9474

0.9573

0.9656

0.8708

0.8907

0.9082

0.9236

0.9370

0.9484

0.9582

0.9664

0.8729

0.8925

0.9099

0.9251

0.9382

0.9495

0.9591

0.9671

Thus, approximately 18.59% of dolphins weigh between 410 and 425 pounds.

0.8749

0.8944

0.9115

0.9265

0.9394

0.9505

0.9599

0.9678

0.8770

0.8962

0.9131

0.9279

0.9406

0.9515

0.9608

0.9686

0.8790

0.8980

0.9147

0.9292

0.9418

0.9525

0.9616

0.9693

0.8810

0.8997

0.9162

0.9306

0.9429

0.9535

0.9625

0.9699

0.8830

0.9015

0.9177

0.9319

0.9441

0.9545

0.9633

0.9706

Normal Distribution Area Calculator Z Score Calculator

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