

Lesson 15: Calculating Area and Values from the Normal Curve

Daily Data Collection

Find your heart rate.

Class Data:

Find the mean and standard deviation for the heartrate data.

Mean:

St. Dev.:

Draw an accurate normal curve.

Find your z-value and explain the meaning of the value.

What percent of the class have a heartrate faster than yours?

What percent of the class have a heartrate slower than yours?

30% of the data are below what value?

30% of the data are above what value?

What percent of the data are between values 40 and 70?

What percent of the data are outside values 70 and 90?

Find the first quartile

We can tell the percentile to the left of a z-value using table A:

Z	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	0.5000	0.5040	0.5080	0.5120	0.5160	0.5199	0.5239	0.5279	0.5319	0.5359
0.1	0.5398	0.5438	0.5478	0.5517	0.5557	0.5596	0.5636	0.5675	0.5714	0.5753
0.2	0.5793	0.5832	0.5871	0.5910	0.5948	0.5987	0.6026	0.6064	0.6103	0.6141
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	0.9031	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
1.7	0.9554	0.9564	0.9573	0.9582	0.9591	0.9599	0.9608	0.9616	0.9625	0.9633
1.8	0.9641	0.9649	0.9656	0.9664	0.9671	0.9678	0.9686	0.9693	0.9699	0.9706
1.9	0.9713	0.9719	0.9726	0.9732	0.9738	0.9744	0.9750	0.9756	0.9761	0.9767
2.0	0.9772	0.9778	0.9783	0.9788	0.9793	0.9798	0.9803	0.9808	0.9812	0.9817
2.1	0.9821	0.9826	0.9830	0.9834	0.9838	0.9842	0.9846	0.9850	0.9854	0.9857
2.2	0.9861	0.9864	0.9868	0.9871	0.9875	0.9878	0.9881	0.9884	0.9887	0.9890
2.3	0.9893	0.9896	0.9898	0.9901	0.9904	0.9906	0.9909	0.9911	0.9913	0.9916
2.4	0.9918	0.9920	0.9922	0.9924	0.9927	0.9929	0.9931	0.9932	0.9934	0.9936
2.5	0.9938	0.9940	0.9941	0.9943	0.9945	0.9946	0.9948	0.9949	0.9951	0.9952
2.6	0.9953	0.9955	0.9956	0.9957	0.9958	0.9960	0.9961	0.9962	0.9963	0.9964
2.7	0.9965	0.9966	0.9967	0.9968	0.9969	0.9970	0.9971	0.9972	0.9973	0.9974
2.8	0.9974	0.9975	0.9976	0.9977	0.9977	0.9978	0.9979	0.9979	0.9980	0.9981
2.9	0.9981	0.9982	0.9982	0.9983	0.9984	0.9984	0.9985	0.9985	0.9986	0.9986

Or, use the AP Stats Program.

Guided Practice:

What is the probability to the left of z value 2.63?

What is the probability to the right of z value 1.58?

What is the probability between z values 0.2 to 1.5?

What is the probability outside of z values 1 to 2.3?

What z value has a probability to the left equal to .75?

What z value has a probability to the right equal to .4?

Lesson 15 Extra Questions

Describe the meaning of being in the 45th percentile

Define the following:

Describe the meaning of mean = 3

Describe the meaning of standard deviation = 1.5

Draw a normal curve with mean 3 and standard deviation 1.5

What is the area under the standard normal curve?

What is the difference between a normal distribution curve and a standard normal distribution curve?

What % of values are within 1 standard deviation of the mean?

What % of values are within 2 standard deviation of the mean?

What % of values are within 3 standard deviation of the mean?

Describe the meaning of a z-score of -0.6

Type 1: Given a $z=0.45$, find percent left

Type 2: Given percent left = 0.62, find z

Type 3: Given a $z=1.22$, find percent right

Type 4: Given percent right=0.35, find z

Type 5: Given 2 z-values, $Z = -1.42$ and 2.68 , find percent between

Type 6: What is the percent outside of the z-values?

Type 7: mean = 20, st dev. = 2.5, $x = 17$, find z , find percent left, find percent right.

Type 8: mean = 20, st dev. = 2.5, percent right = 0.8, Find the value.

Type 9: percent right = .8, value = 30, mean = 42 Find the stand. Dev.

Type 10: mean = 100, st. dev = 5.8 Find the IQR.

Draw a normal curve with a mean of 80 and a standard deviation of 12. Then add a standard z-axis labels.

What percent of data are below 85?

30% of the data are below what value?

30% of the data are above what value?

What percent of the data are between values 30 and 40?

What percent of the data are outside values 30 and 45?

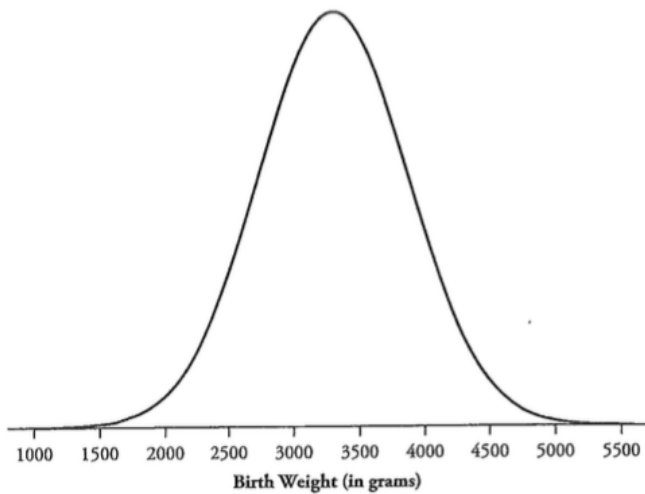
Find the first quartile

Find the third quartile

Find the IQR and find the value at which data values are considered outliers because they are too large.

What percent of values are above the upper outlier value?

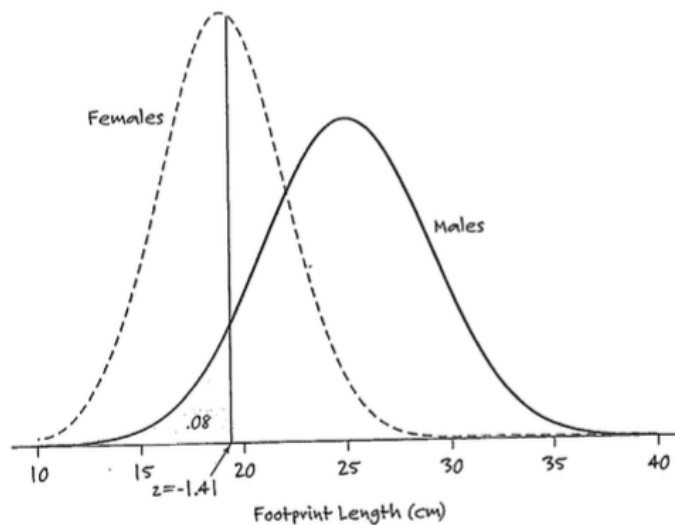
Birth weights of babies in the U.S. can be modeled by a normal distribution with mean 3300 grams (about 7.3 pounds) and standard deviation 570 grams (about 1.3 pounds). Babies weighing less than 2500 grams (about 5.5 pounds) are considered to be of low birth weight.



Shade the portion of the curve that reflects low birth weight.

What is the z-value for the low weight value?

What percent of births are low weight?



Who has a larger footprint – males or females – Explain:

Who has more variation in the size of the footprint? Explain:

A footprint is found that is 19.36 cm long. What is the probability of finding a female with a larger footprint? A male?