



Probability Content from $-\infty$ to Z

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	0.9131	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
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

On a physical fitness test at pilot training school in the Air Force the mean score was 114.6 with a standard deviation of 5.

a) If your score was a 118 find the percent of trainees that scored below you.

75.17%

b) If your score was 125 find the percent of trainees that scored above you.

1.88%

c) If your score was 106 find the percent of trainees that scored above you.

95.73%

d) If your score was 102 find the percent of trainees that scored below you.

0.59%

e) To be considered for Top Gun school you must score in the top 3%.

What score did you need on the fitness test?

124

A company makes nails and sells them in boxes of 200 nails. The lengths of the nails are normally distributed with a mean of 3 inches and a standard deviation of 0.05 in.

1. What range of lengths contain 95% of the nails? 2.90 in to 3.10 in

2. What % of the nails are shorter than 2.95 in long? 16.1%

3. If you were to grab a random nail what is the probability that you grab one longer than 3.1 in long? 2.5%

4. If you were to grab a random nail what is the probability that you grab one between 2.9 and 3.05 inches long? 81.5%

5. How many nails in a box would measure more than 3.08 inches long?

$$z = \frac{3.08 - 3}{0.05} = 1.6 \quad 5.48\% \text{ of } 200 \approx 11$$

To win a prize, a tomato must be greater than 4 inches in diameter. The diameters of a crop of tomatoes grown on your farm are normally distributed with a mean of 3.2 inches and a standard deviation of 0.4 inches.

Find the probability that your crop will contain a winning tomato.

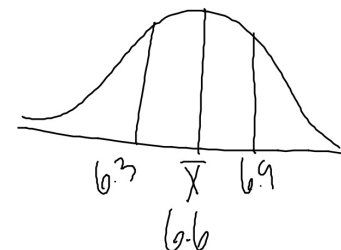
2.5%

To qualify as a contestant in a race, a runner has to be in the fastest 16% of all applicants. The running times are normally distributed with a mean of 63 minutes and a standard deviation of 4 minutes. What is the qualifying time for the race?

Less than 59 min
or
Between 0 to 59

The weights of newborn babies is normally distributed with 68% of the newborns weighing from 6.3 pounds to 6.9 pounds.

Find the mean weight and the standard deviation of these newborns.

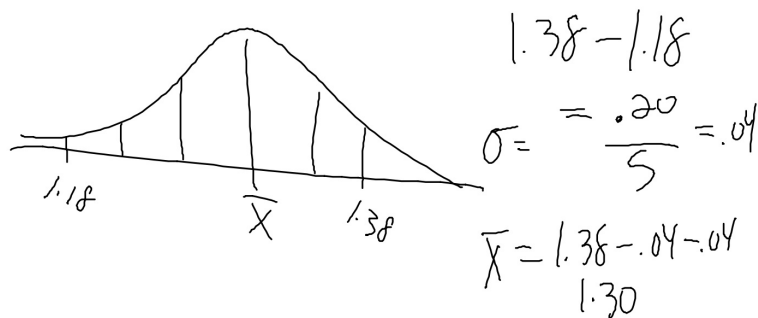


$$\bar{x} = \frac{6.9 + 6.3}{2} = 6.6$$

$$\sigma = 6.9 - 6.6 = .3$$

The diameters of a sample of Ping-Pong balls shows that the diameter of a ball that is 3 standard deviations below the mean is 1.18 in and the diameter of a ball that is 2 standard deviations above the mean is 1.38 inches.

Find the mean and standard deviation of this sample.



Tubs of a certain brand of butter have weights that are normally distributed and have a mean weight of 1 lb and a standard deviation of 0.06 lbs.

At a quality control checkpoint a sample of tubs is taken and weighed. It turns out 12 of these tubs weigh less than 0.88 lbs.

How many tubs were in the sample? 480

2.5% of the tubs weigh less than 0.88 lbs.

$$\frac{2.5}{100} = \frac{12}{x}$$

$$(.025)(x) = 12$$