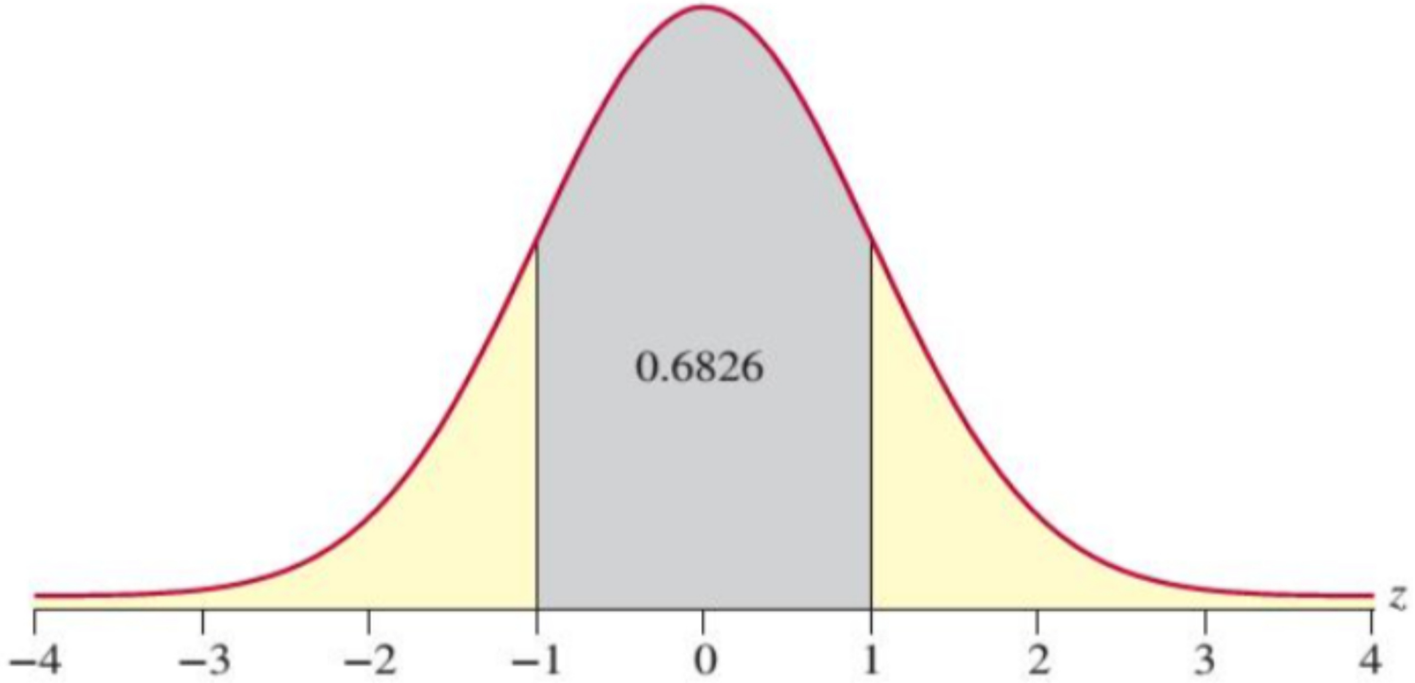
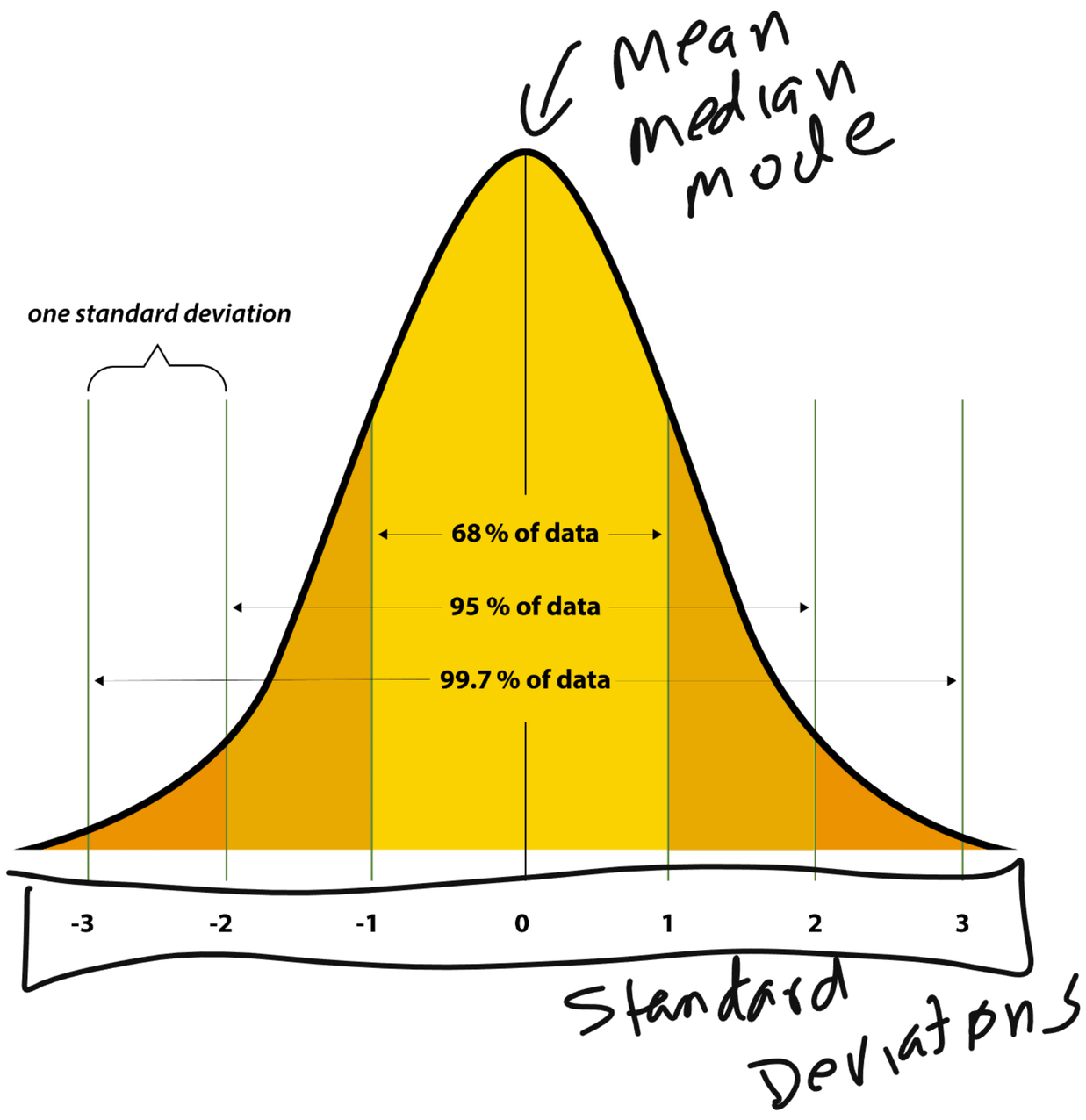
BitPaper
Share Knowledge

8.2 The Normal Distribution

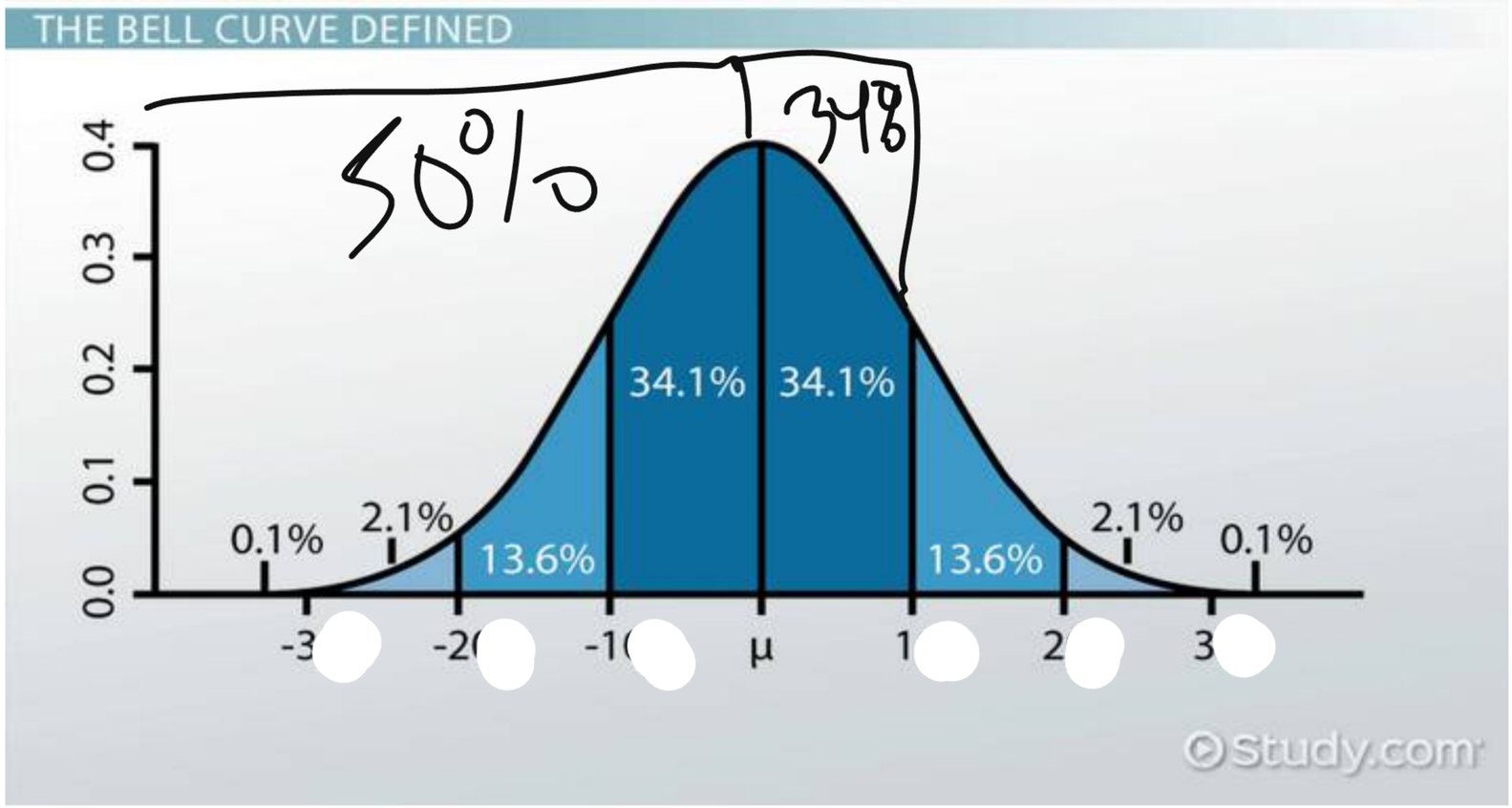


BitPaper
Share Knowledge



BitPaper
Share Knowledge

84%



BitPaper
Share Knowledge

Z-score

$$Z = \frac{X - \mu}{\sigma}$$

BitPaper
Share Knowledge

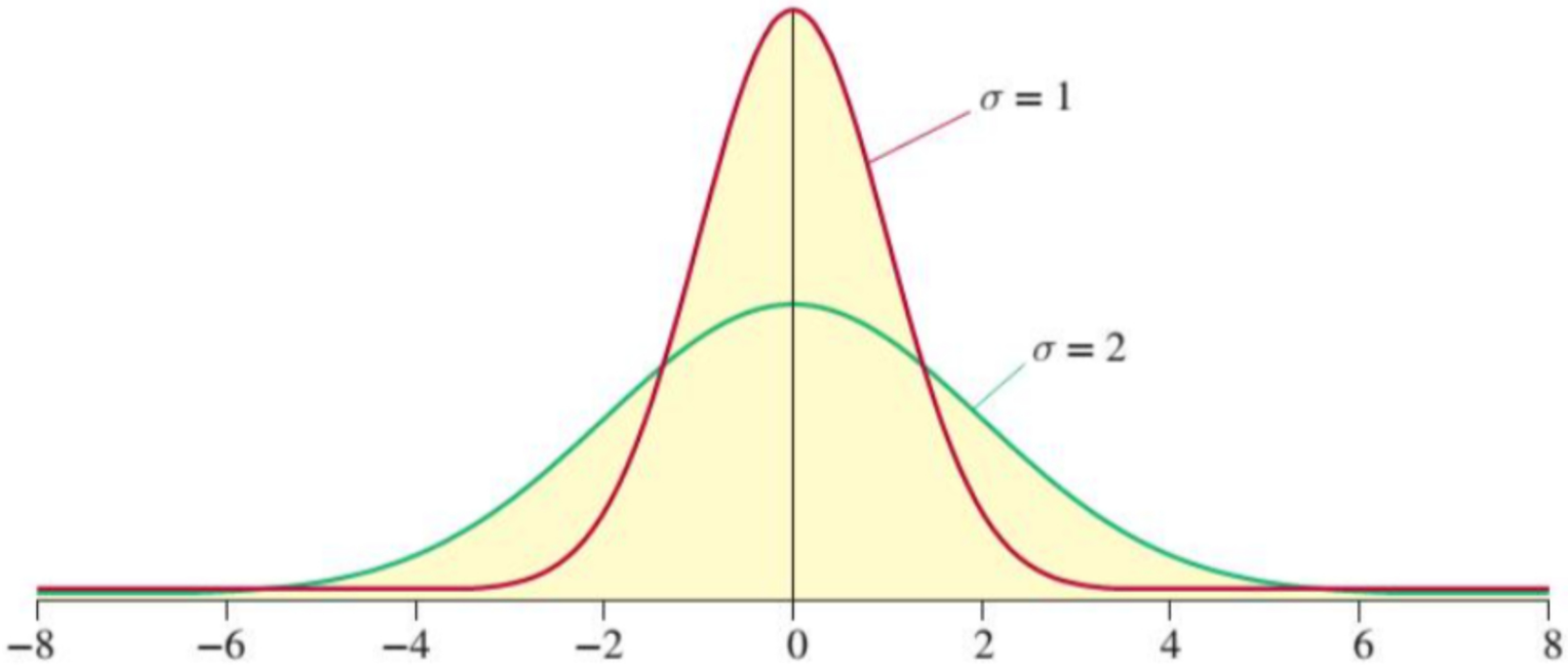
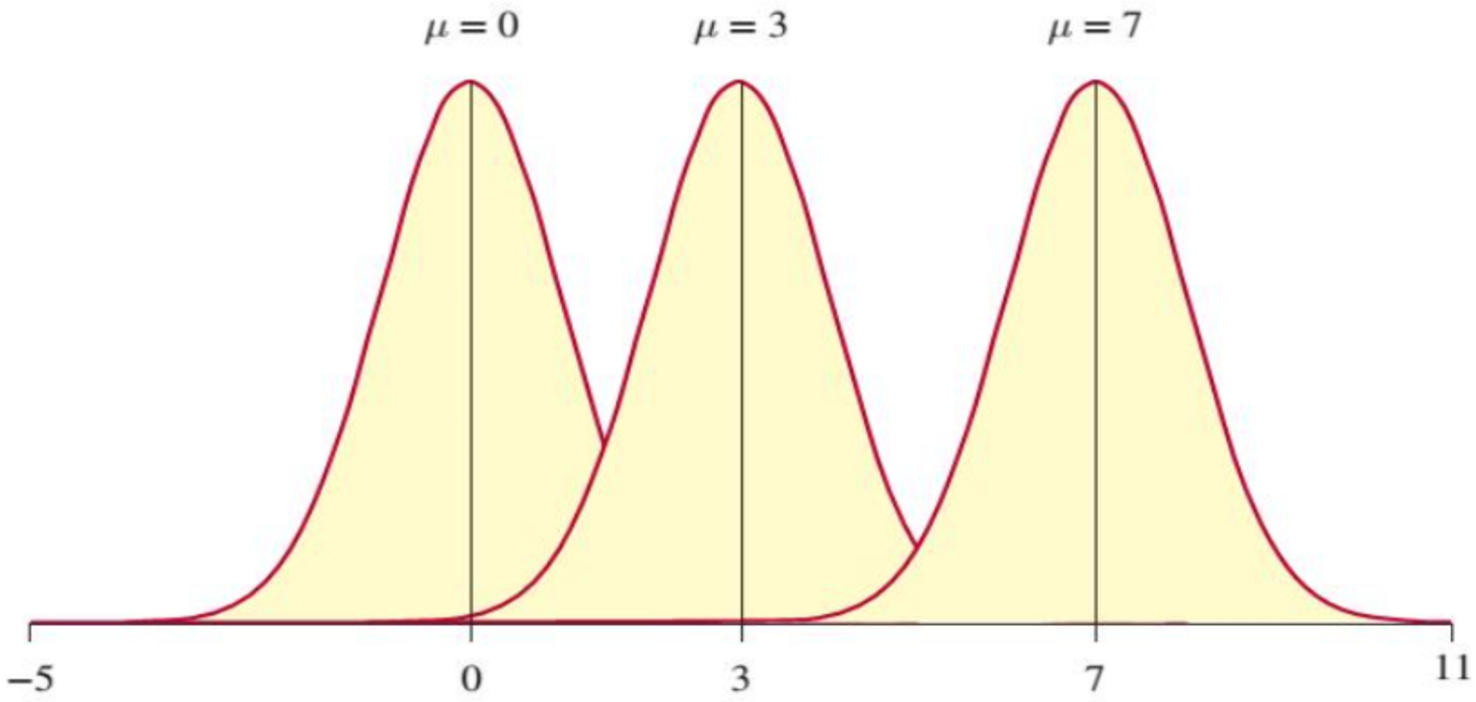
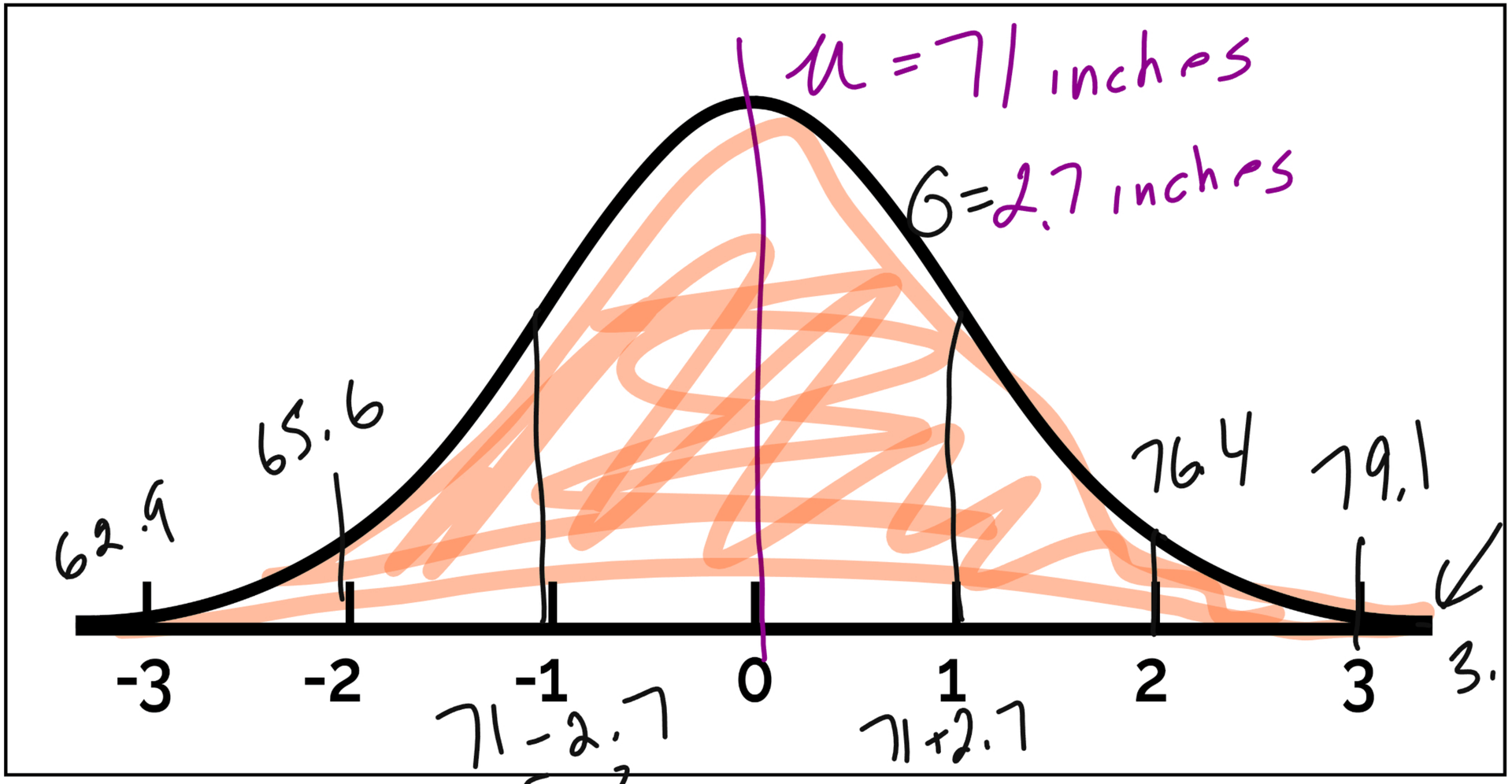


Figure 8.2.5

BitPaper
Share Knowledge




μ = 71 inches
σ = 2.7 inches
62.9
65.6
76.4
79.1
80
-3
-2
-1
0
1
2
3
71 - 2.7
68.3
71 + 2.7
73.7in
.9996
3.33

BitPaper
Share Knowledge

$$\text{Z-score} = \frac{X - \mu}{\sigma}$$

$X = 80$ inches

$\mu = 71$ inches

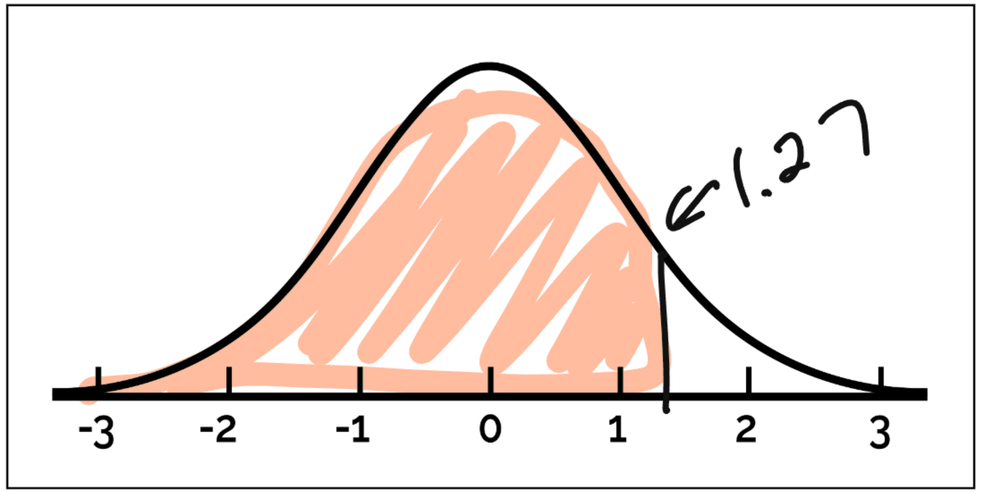
$\sigma = 2.7$ inches

$$Z = \frac{80 - 71}{2.7} = 3.33$$

BitPaper
Share Knowledge

Compute the probability that a standard normal random variable is less than 1.27.

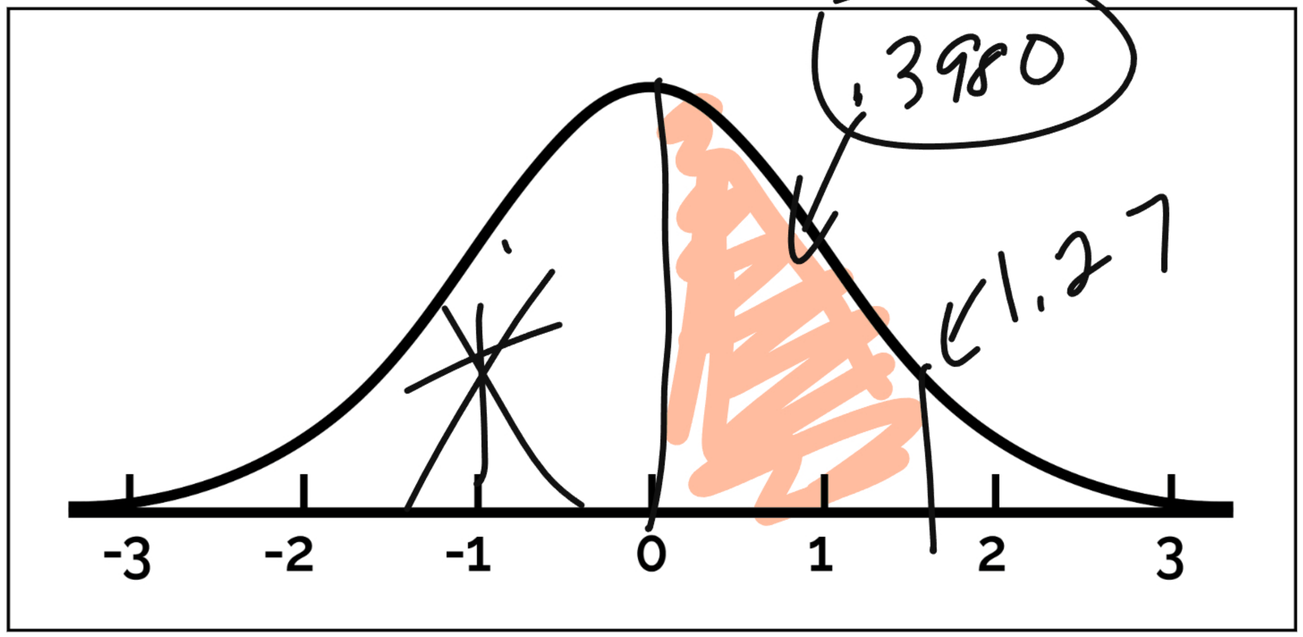
z-score



.8980

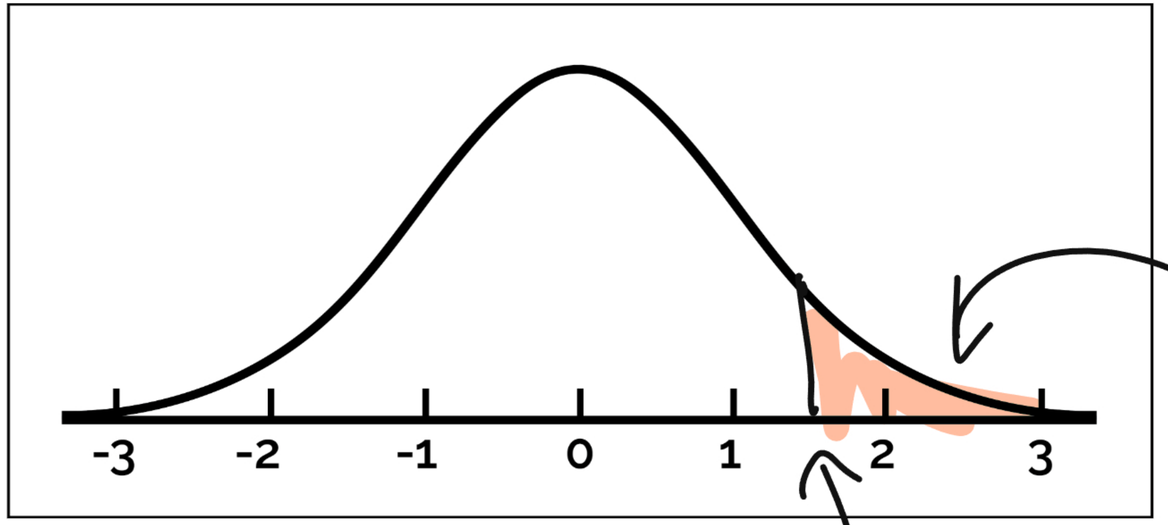
z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	.5000	.5040	.5080	.5120	.5160	.5199	.5239	.5279	.5319	.5359
0.1	.5398	.5438	.5478	.5517	.5557	.5596	.5636	.5675	.5714	.5753
0.2	.5793	.5832	.5871	.5910	.5948	.5987	.6026	.6064	.6103	.6141
0.3	.6179	.6217	.6255	.6293	.6331	.6368	.6406	.6443	.6480	.6517
0.4	.6554	.6591	.6628	.6664	.6700	.6736	.6772	.6808	.6844	.6879
0.5	.6915	.6950	.6985	.7019	.7054	.7088	.7123	.7157	.7190	.7224
0.6	.7257	.7291	.7324	.7357	.7389	.7422	.7454	.7486	.7517	.7549
0.7	.7580	.7611	.7642	.7673	.7704	.7734	.7764	.7794	.7823	.7852
0.8	.7881	.7910	.7939	.7967	.7995	.8023	.8051	.8078	.8106	.8133

Compute the probability that a standard normal random variable is between 0 and 1.27.



.8980
-.5000

Determine the probability that a standard normal random variable is greater than 1.27.

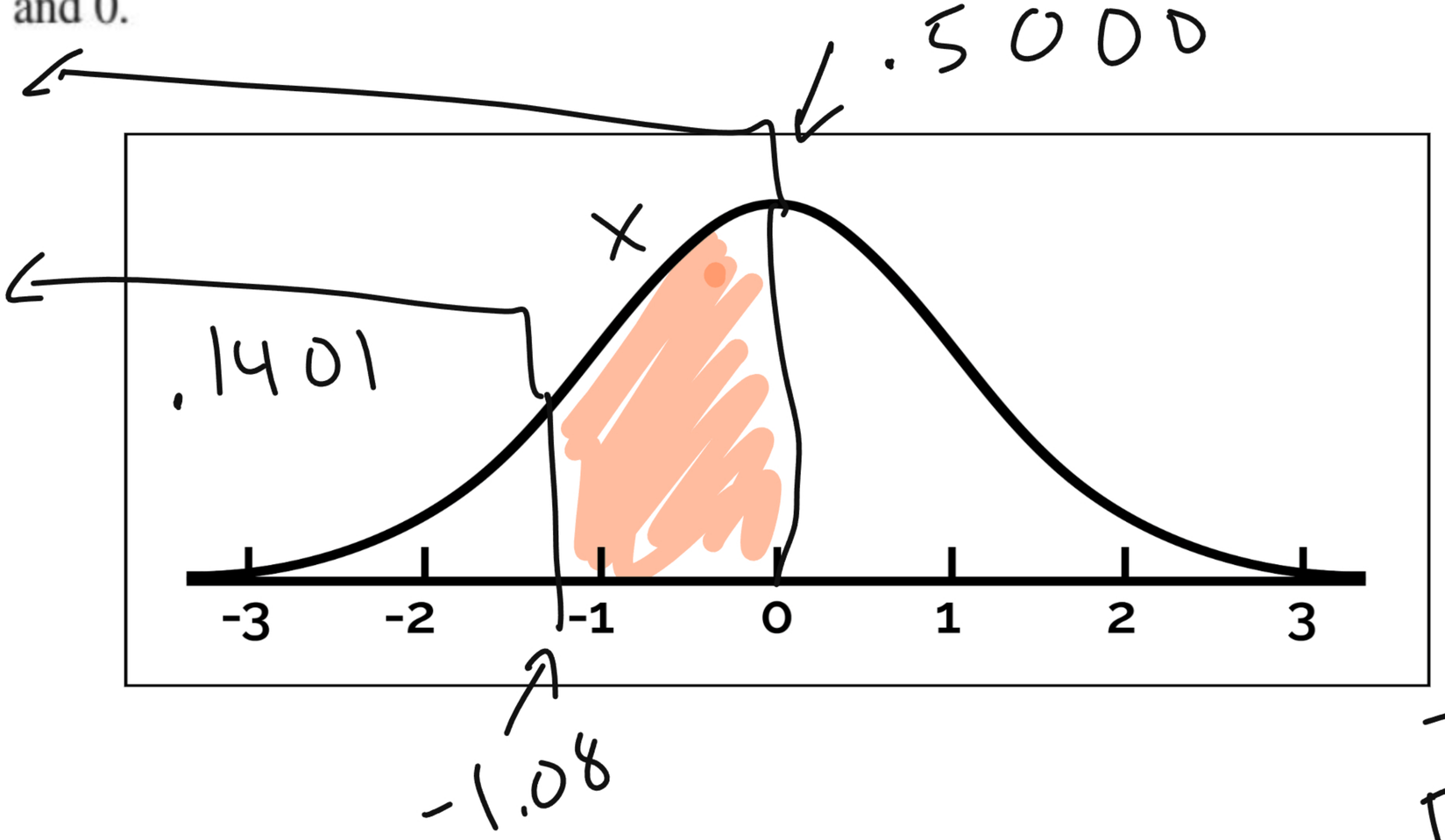


1 − .8980

.1020

1.27

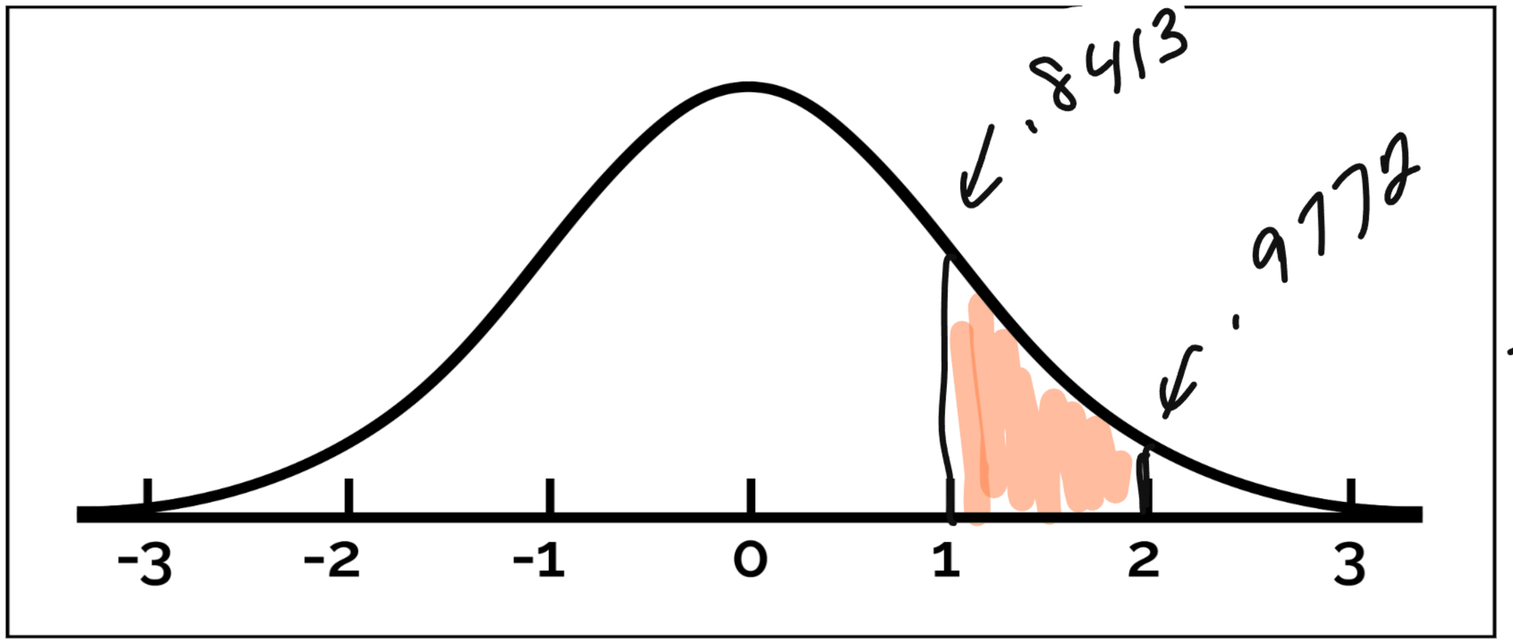
Determine the probability that a standard normal random variable is between −1.08 and 0.



Z
−1.08 →
.1401
P(z)

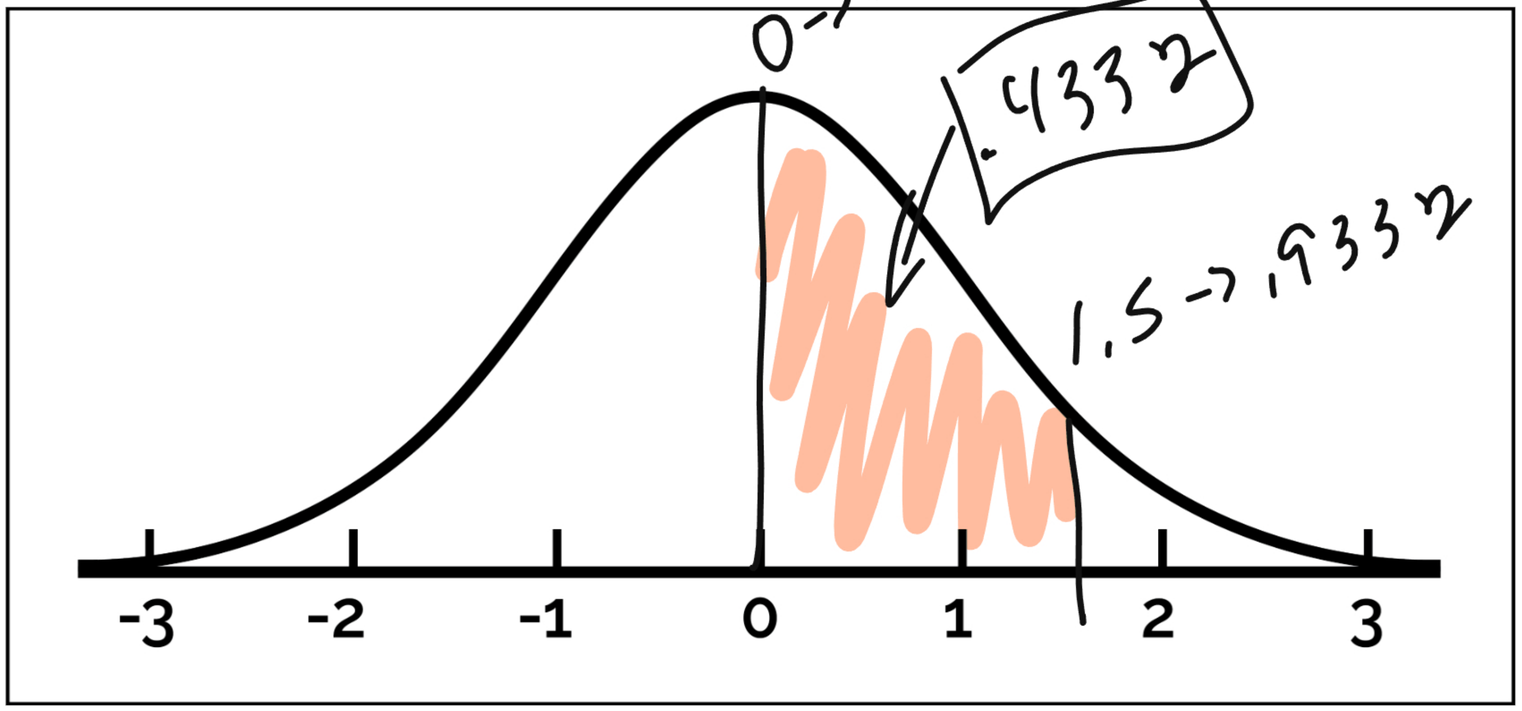
.5000
−.1401
.3599

What is the probability that a standard normal random variable will be between 1 and 2?



.9772
− .8413
.1359

Find the probability that a normal random variable with a mean of 10 and a standard deviation of 20 will lie between 10 and 40.



$$z = \frac{x - \mu}{\sigma}$$

$\mu = 10$

$\sigma = 20$

$x = 10$

$$z = \frac{10 - 10}{20}$$

$z = 0$

$x = 40$

$$z = \frac{40 - 10}{20}$$

$z = 1.5$

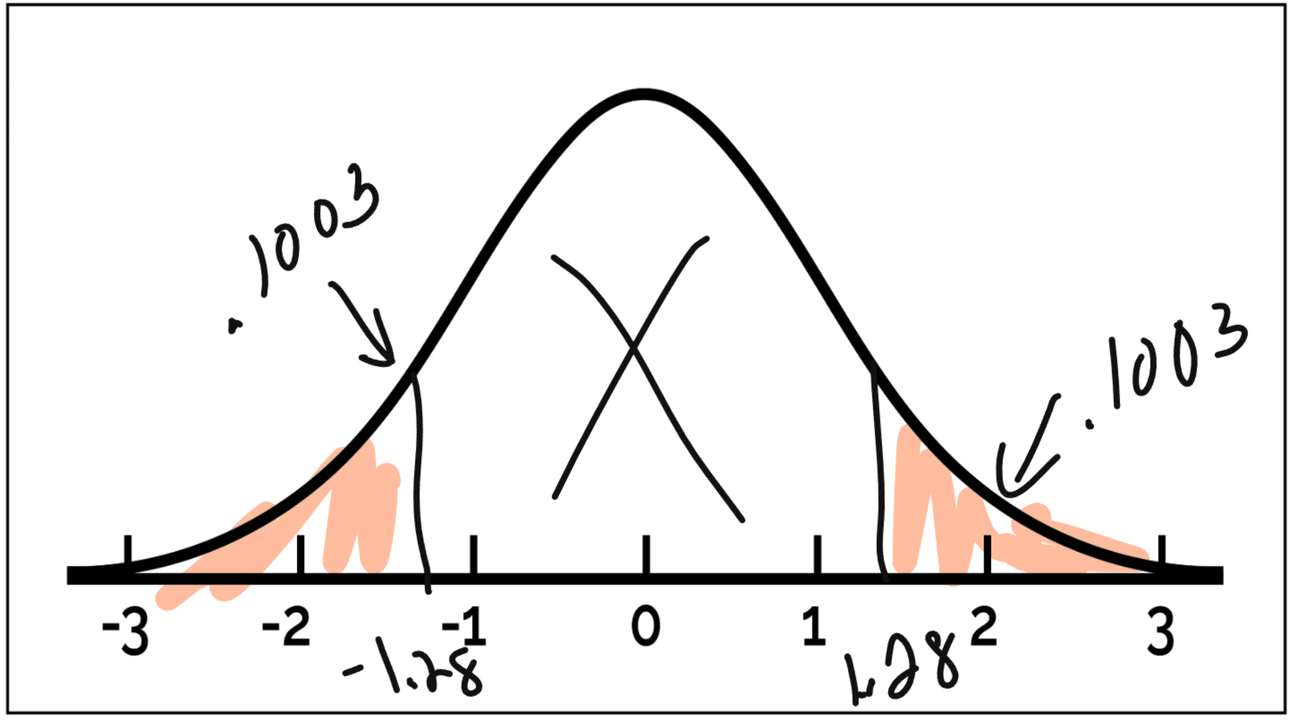
Using the standard normal tables in Appendix A, determine the following probabilities. Sketch the associated areas.

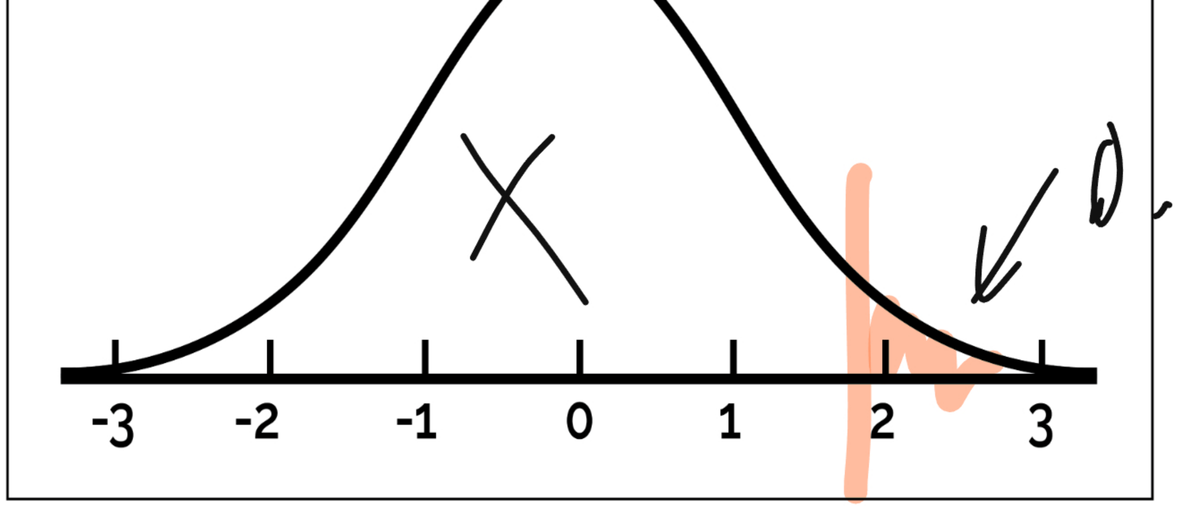
a. $z \leq -1.28$ .1003

b. $z \geq 1.28$ .1003

c. $-1.28 \leq z \leq 1.28$ .7994

1 − .2006





.04 .05

1.4	.9192	.9207	.9222	.9236	.9251	.9265	.9279	.9292	.9306	.9319
1.5	.9332	.9345	.9357	.9370	.9382	.9394	.9406	.9418	.9429	.9441
1.6	.9452	.9463	.9474	.9484	.9495	.9505	.9515	.9525	.9535	.9545
1.7	.9554	.9564	.9573	.9582	.9591	.9599	.9608	.9616	.9625	.9633
1.8	.9641	.9649	.9656	.9664	.9671	.9678	.9686	.9693	.9699	.9706

1.645