

Jingle BELLWORK

1. The z-score is 1.78. What is the probability to the left?

.9025

2. The z-score is -2.3. What is the probability to the right?

1 - 0.0107 = .9893

3. What is the probability between -3.4 and 0.62?

.7324 - .0003 = .7321

4. If the probability is 0.9838, what is the z-score?

2.14

5. If the probability is 0.2420, what is the z-score?

-.7



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Continuing on with 6.2

YESTERDAY?!?!

We learned how to use "Table A" to find probabilities LESS than a certain z-score.

Don't ya think there should be a way to do this on our calculators to spare us the weight of carrying around the table?

HECK to the YEAH!



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CALCULATOR COMMANDS

2nd VARS
normalcdf(min,max)

*use $-1E99$ for $-\infty$

* use $1E99$ for ∞

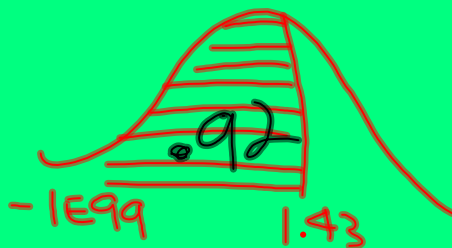
Use to find
decimal /
proportion /
area under curve



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Practice Example

What's the probability that a normal random variable is less than 1.43 standard deviations above the mean?



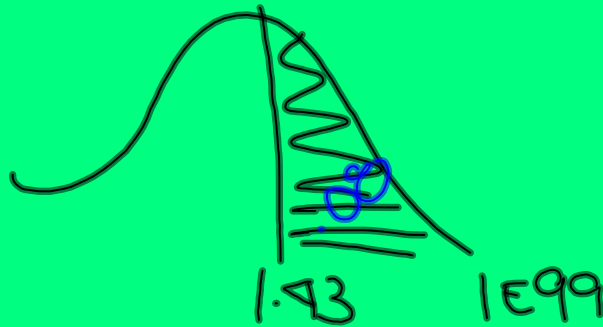
normalcdf($-1E99, 1.43$)



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Practice Example

What's the probability that a normal random variable is more than 1.43 standard deviations above the mean?



$$\text{normalcdf}(1.43, 1E99) = .08$$



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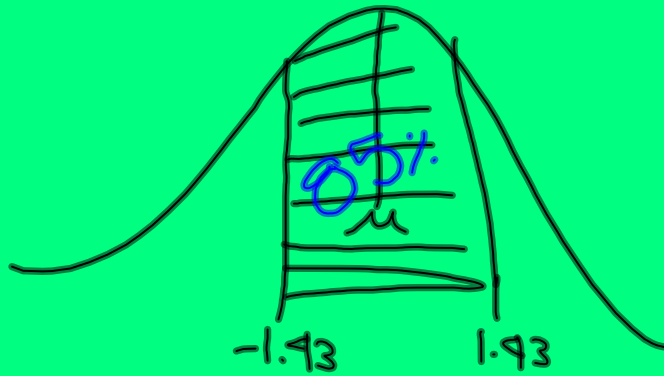
In fact, our calculator is more exact than the table! Boo-yah!



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Practice Example

Find the probability that a normal random variable assumes a value within 1.43 standard deviations of μ on either side



$$\text{Normalcdf}(-1.43, 1.43) = .85$$



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Practice Example

Find probability to the left of -1.64

$$\text{Normalcdf}(-1E99, -1.64) = .05$$



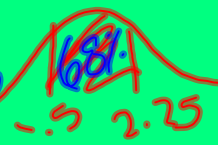
Find probability to the right of 1.56

$$\text{Normalcdf}(1.56, 1E99) = .06$$



Find probability between $-.50$ and 2.25

$$\text{Normalcdf}(-.5, 2.25) = .60$$



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Remember Going Backwards on the Table?!?!



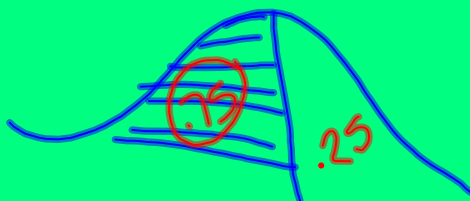
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CALCULATOR COMMANDS

2nd VARS
invNorm(percentile decimal)

use when trying
to find z-score /
observation

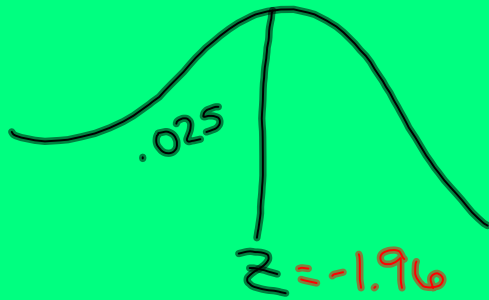
*the calculator is a little less smart on this one – you always
have to tell it the area below/to the left



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Practice Example

Find the value of z for a cumulative probability of 0.025.



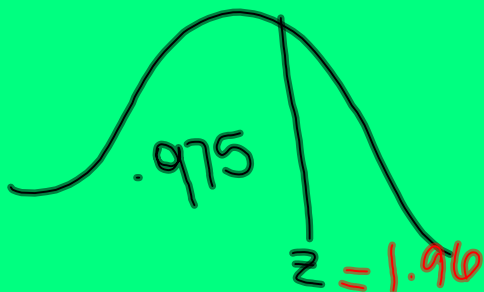
$\text{Inv Norm}(.025)$



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Practice Example

Find the value of z for a cumulative probability of 0.975.



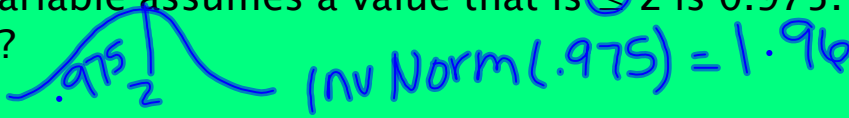
$\text{Inv Norm}(.975) = 1.96$



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Practice Example

1. The probability that a standard normal random variable assumes a value that is $\leq z$ is 0.975. What is z ?



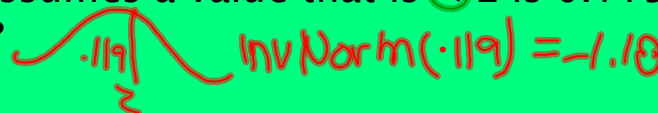
2. The probability that a standard normal random variable assumes a value that is $> z$ is 0.025. What is z ?



3. The probability that a standard normal random variable assumes a value that is $\geq z$ is 0.881. What is z ?



4. The probability that a standard normal random variable assumes a value that is $< z$ is 0.119. What is z ?



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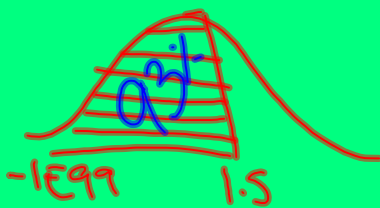
Practice Example

You score 650 on the SAT which has $\mu=500$ and $\sigma=100$ and 30 on the ACT which has $\mu=21.0$ and $\sigma=4.7$. On which test did you perform better? Compare z-scores

In what percentile did you score for each exam?

SAT = 1.5

ACT: $z = 1.91$



$normcdf(-1.99, 1.5) = .93$

$normcdf(-1.99, 1.91) = .97$



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Wouldn't it be nice if we didn't have to find the Z-Score first
EVERY SINGLE TIME!



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CALCULATOR COMMANDS

2nd VARS

normalcdf (min, max, mean, st.dev.)

*use $-1E99$ for $-\infty$

*use $1E99$ for ∞

Use to find
area/decimal/%.
under curve

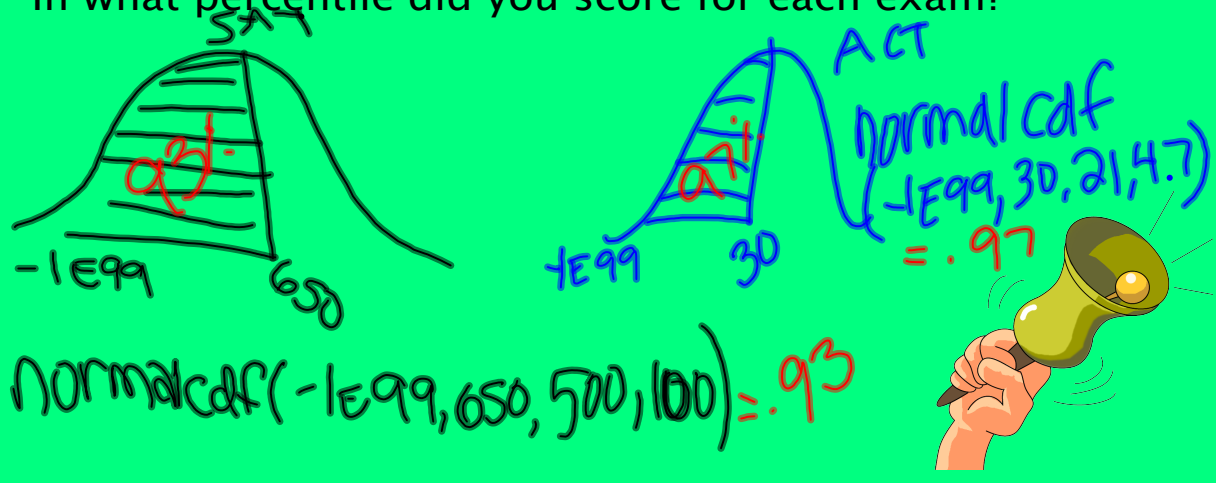


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Practice Example

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In what percentile did you score for each exam?



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Practice Example

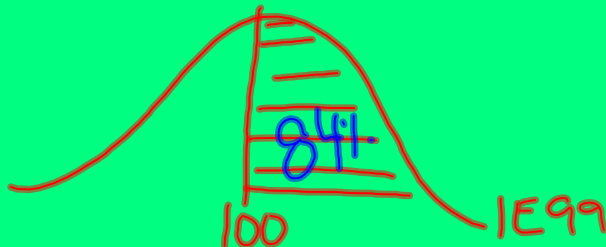
Adult systolic blood pressure is normally distributed with $\mu = 120$ and $\sigma = 20$. What percentage of adults have systolic blood pressure less than 100?



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Practice Example

Adult systolic blood pressure is normally distributed with $\mu = 120$ and $\sigma = 20$. What percentage of adults have systolic blood pressure greater than 100?



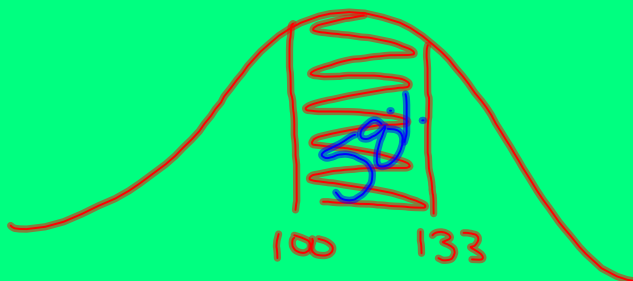
$$\text{normalcdf}(100, 1E99, 120, 20) = .84$$



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Practice Example

Adult systolic blood pressure is normally distributed with $\mu = 120$ and $\sigma = 20$. What percentage of adults have systolic blood pressure between 100 and 133?



$$\text{normalcdf}(100, 133, 120, 20) = .58$$



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Practice Example

Adult systolic blood pressure is normally distributed with $\mu = 120$ and $\sigma = 20$. 10% of adults have systolic blood pressure above what level?

OMG! What do we do?!?!



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Calculator Commands

2nd VARS

invNorm (percentile decimal, mean, st.dev.)



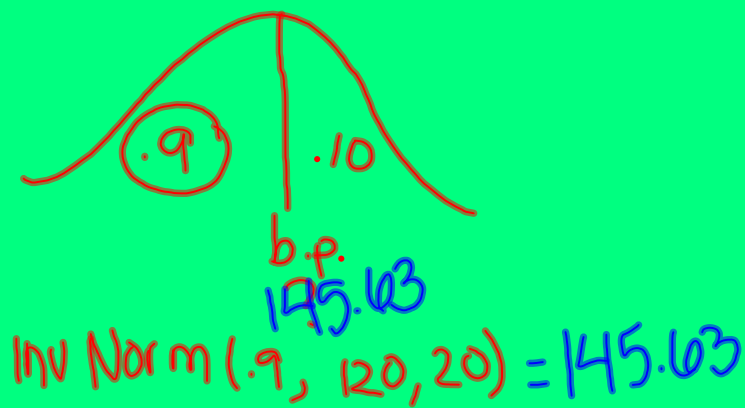
Use when trying
to find observation



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Practice Example

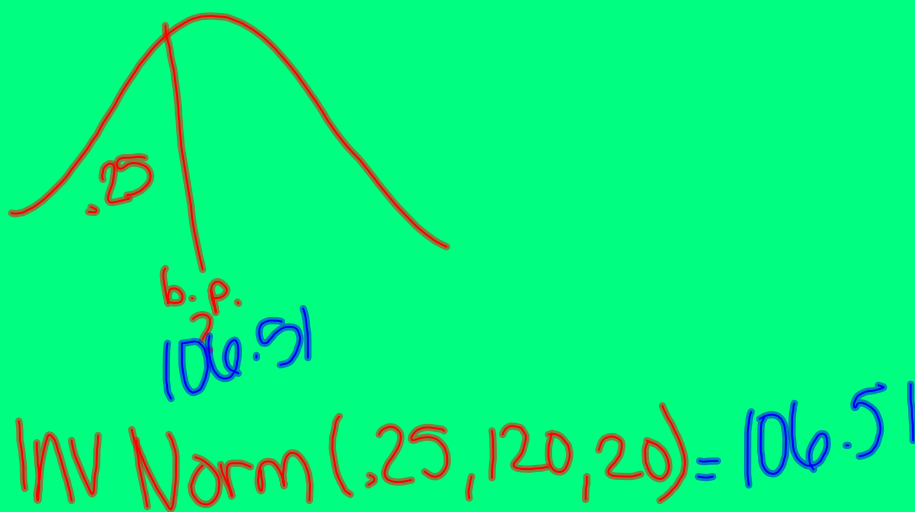
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Practice Example

Adult systolic blood pressure is normally distributed with $\mu = 120$ and $\sigma = 20$. What is the 1st quartile?



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HOMEWORK

6.2 Page 290

#15, 16, 20, 21, 22, 24, 26, 30

It's Book Binder Time!



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