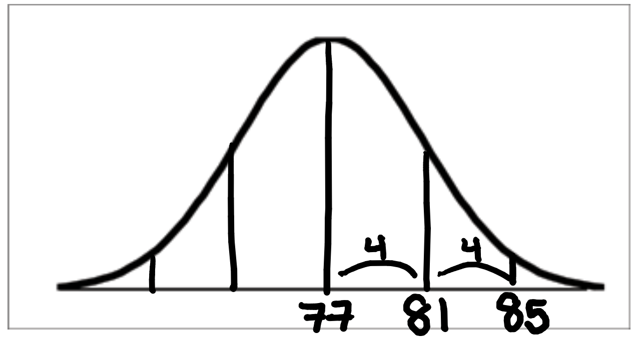
Using the Standard Deviation:

1:

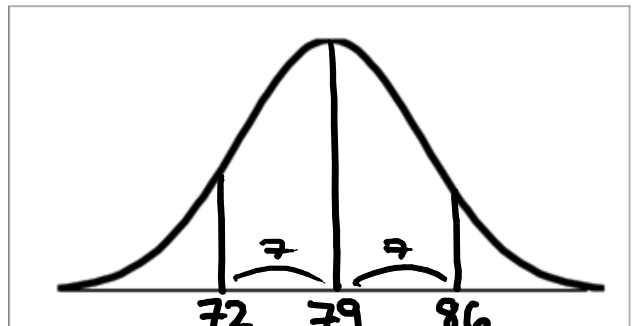
A score of 85 is two standard deviations above the mean. If the standard deviation is 4, find the mean



The mean is 77
(subtract 4 from 85 twice to get the mean)

2:

In a normal distribution, approximately 68% of the scores fall between 72 and 86 and the mean is 79. What is the standard deviation?

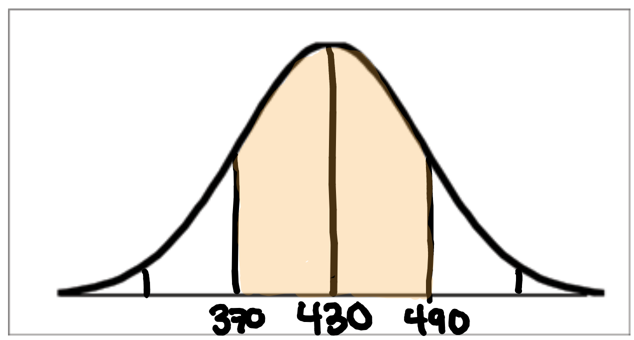


From the 68-95-99 rule, we know that one standard deviation away from the mean contains 68% of the data. So, 86 and 72 are one std. deviation away: 79-72=7

Standard deviation = 7

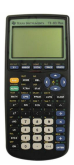
3:

The national mean for verbal scores on an exam was 430 and the standard deviation was 60. Approximately what percent of these taking the test had verbal scores between 370 and 490?



S.D. -2 -1 0 1 2

On calculator:
normalcdf(370,490,430,60)

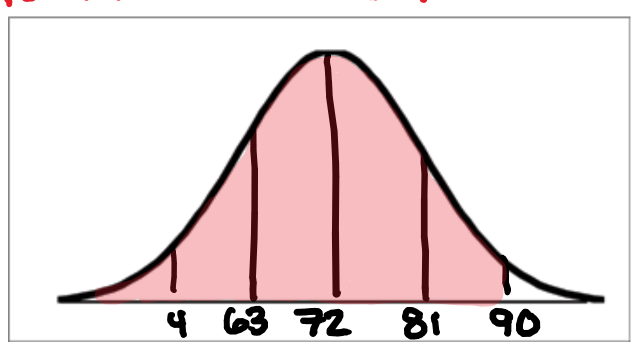


=.6827
= 68.27%

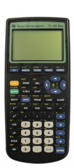
↳ could have used 68-95-99 rule as well!

4:

The scores on a test approximate a normal distribution with a mean score of 72 and a standard deviation of 9. Approximately what percent of the students taking the test received a score lower than 90?

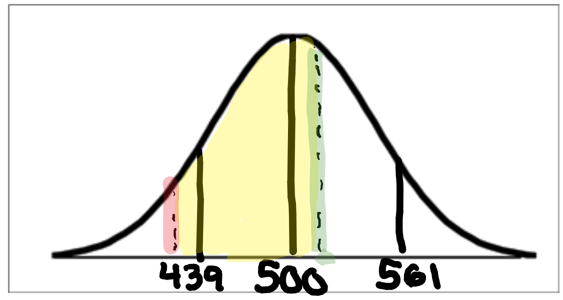


On calculator:
normalcdf(-1000,81,72,9)
=.9772
= 97.72%



1. Battery lifetime is normally distributed for large samples. The mean lifetime is 500 days and the standard deviation is 61 days.

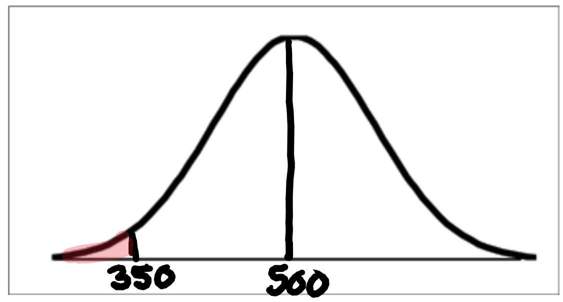
a) Approximately what percent of batteries have lifetime between 420 and 510?



normalcdf(420, 510, 500, 61) =

$\boxed{.47 \text{ or } 47\%}$

b) Approximately what percent of batteries have lifetime **less than** 350?



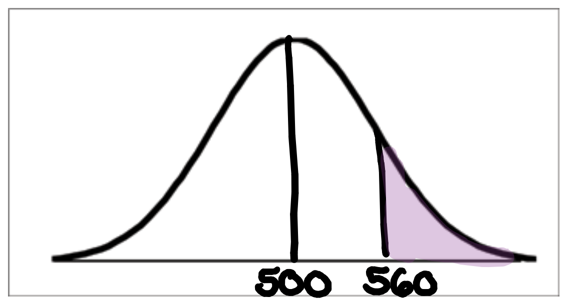
normalcdf(-1000, 350, 500, 61) =

EXTREME lower bound

.0069

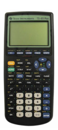
.70%

c) Approximately what percent of batteries have lifetime **greater than** 560?



normalcdf(560, 1000, 500, 61)

.163

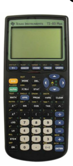


EXTREME upper bound

=16.3%

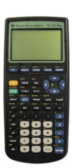
2. A test was given to a large group of students and the scores approximated a normal distribution. If the mean score was 72 with a standard deviation of 7

a) Approximately what percent of the scores were 71 to 73?



normalcdf(71, 73, 72, 7) = .1134 or 11.34%

b) Which is more likely, a student gets a score above 75 or below 68? Explain with calculations to support your answer:

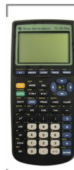


It is about .05 (5%) more likely that a student gets a score above 75.

Above 75:
normalcdf(75, 1000, 72, 7) = .3341

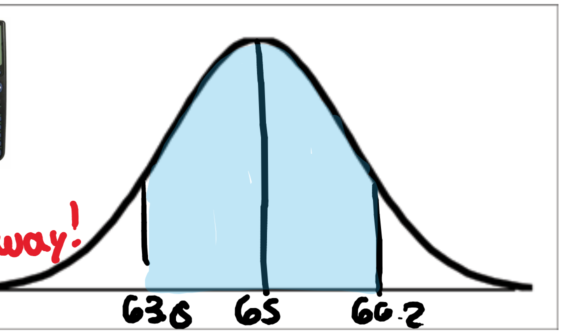
Below 68:
normalcdf(-1000, 68, 72, 7) = .2834

3. The heights of a sample of female students at a High School are normally distributed with a mean height of 65 inches and a standard deviation of 0.6 inch.



a) What percent of this sample is between 63.8 inches and 66.2 inches? 2 standard deviations away!

normalcdf(63.8, 66.2, 65, .6) = .9544
95.44%



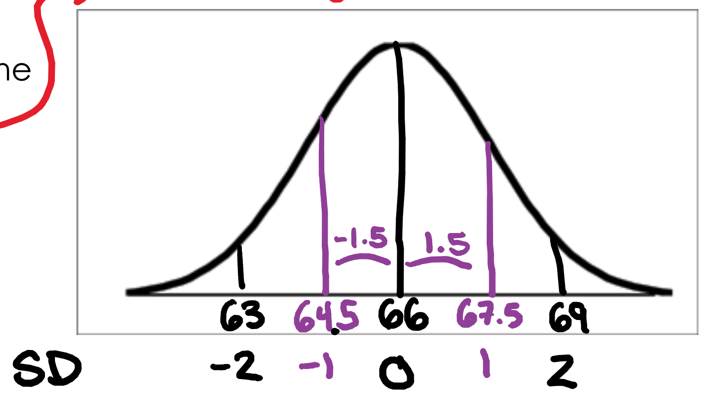
b) **Above what height, in inches, would the top 2.3% of this sample population be found? (HINT: use the 68, 95, 99 rule)

Above 66.2 (2 standard deviations above the mean)

2 standard deviations away!

4. **The heights of a group of girls are normally distributed with a mean of 66 inches. If 95% of the heights of these girls are between 63 and 69 inches, what is the standard deviation for this group? Use 68-95-99 rule!

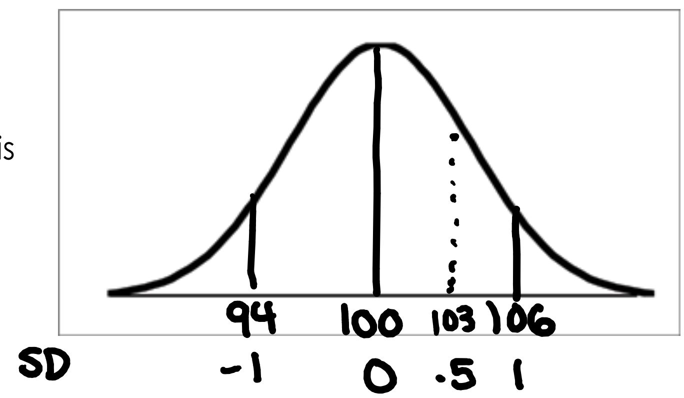
standard deviation = 1.5



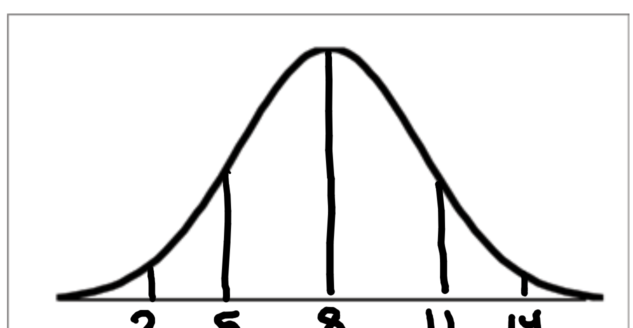
A little bit trickier:

5. The mean of a score is 100 and the standard deviation is 6. How many standard deviations away from the mean is a score of 103 (assume it is normally distributed)?

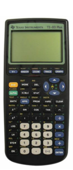
103 is half a standard deviation away OR
.5 standard deviations



6. In a clothes store, the mean size of shoes is an 8 and the standard deviation is 3.



Shaq is looking for a shoe that is greater than 17. Describe to him what the probability is that they will find one!



normalcdf(17, 1000, 8, 3)
= .00135
= .135%

Dude, the probability is VERY VERY low! You have about a 1 in 1000 chance of finding that shoe size!