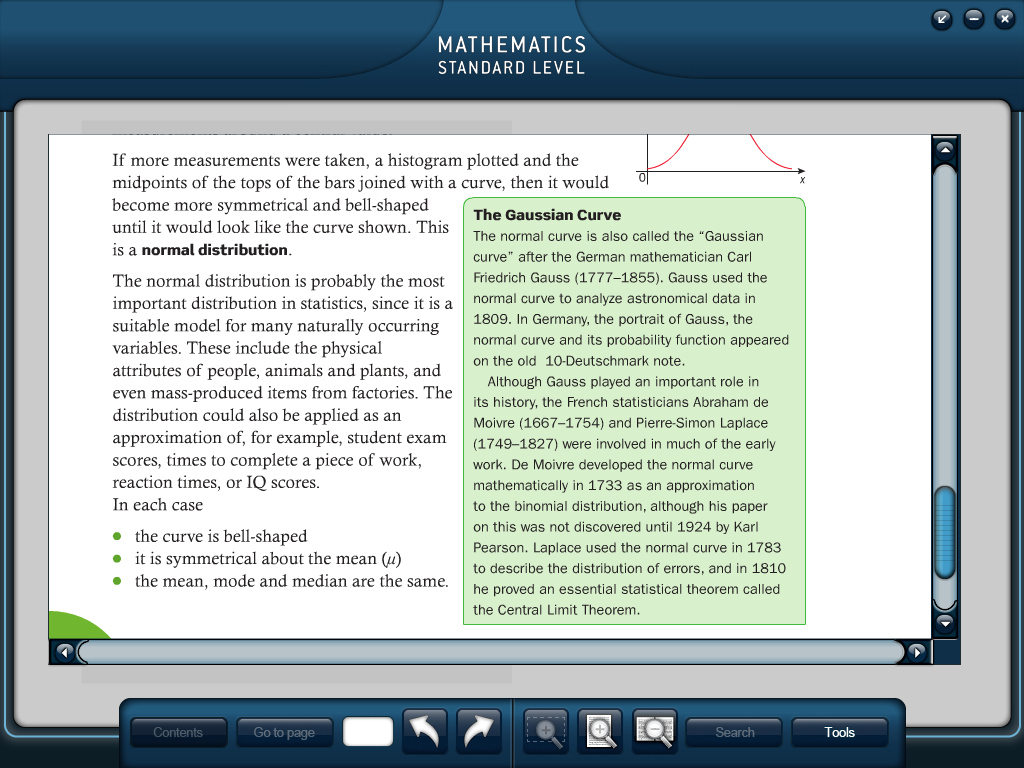
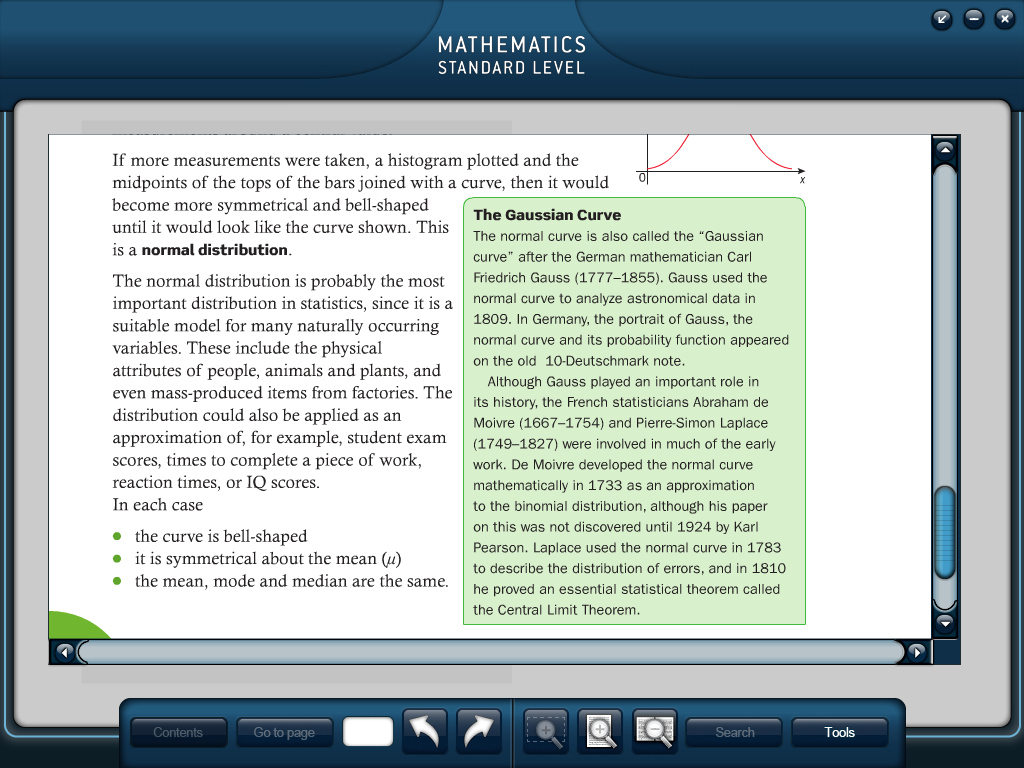
IB Math SL Notes **Review: Normal Distribution**

Unit 5 – Day 9

1. **Standardized Normal Distribution:**

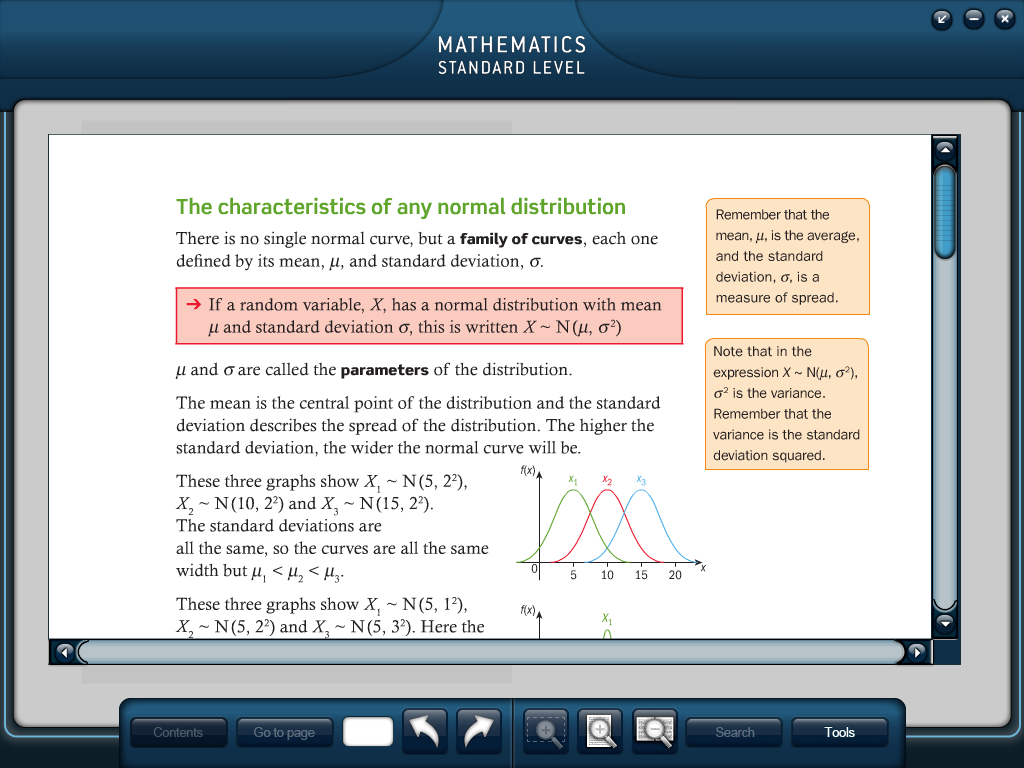
We can collect data, plot it all in a histogram, and connect the tops of each bar together with a smooth curve. If the data is NORMALLY DISTRIBUTED, then the curve will represent a bell shape. We use this “bell curve” to represent the probability/percent of each outcome hence area under the curve must = 1.

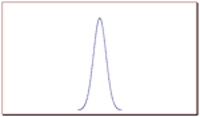
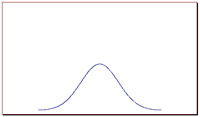
**History Tid-Bit:**

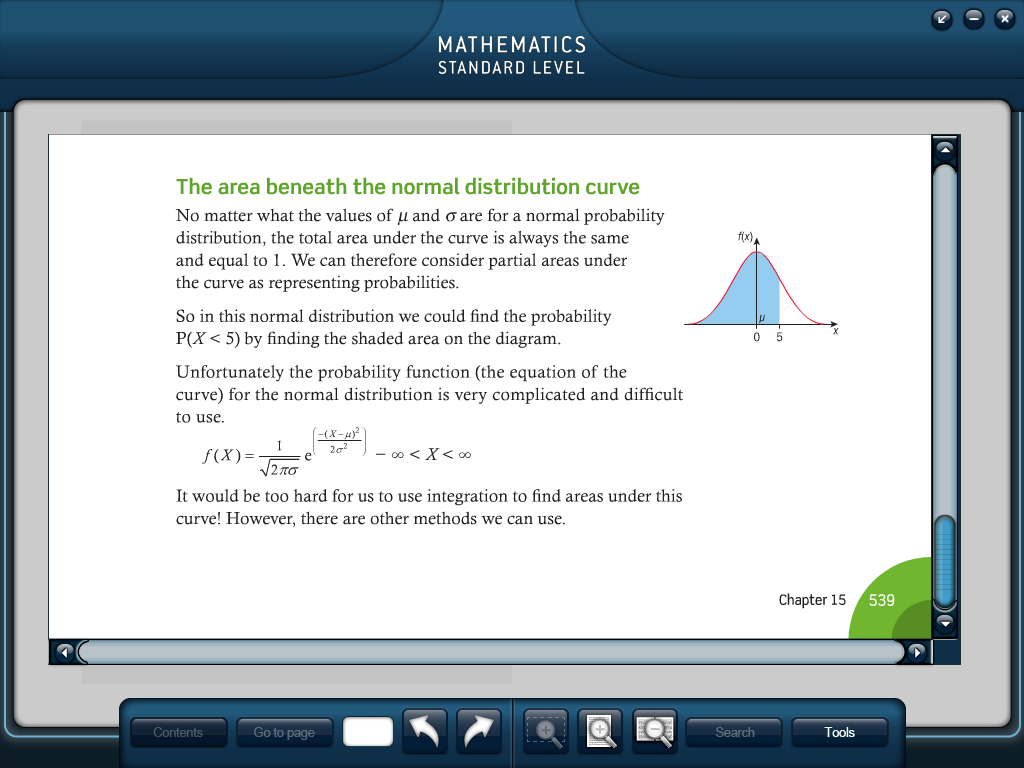


Each bell curve approaches the x-axis asymptotically.

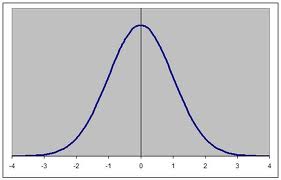
The graph of the normal distribution depends on two factors - the \_\_\_\_\_\_\_\_\_\_ and the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.



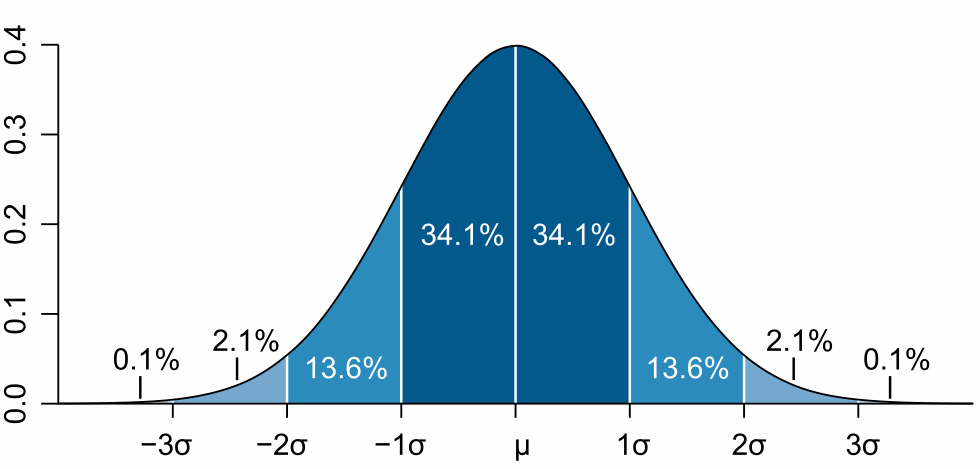
When the standard deviation is large, the curve is short and wide; when the standard deviation is small, the curve is tall and narrow. All normal distributions look like a symmetric, bell-shaped curve, as shown here: 

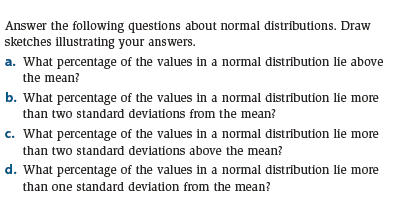
The curve on the left is shorter and wider than the curve on the right, because the curve on the left has a bigger standard deviation.

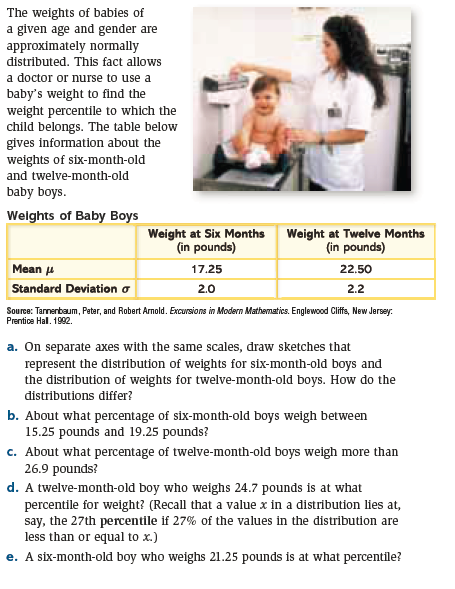
The most basic bell curve is given by and has the formula: .



The following shows the % of data included within different standard deviations of the mean:







Let’s say you want to find the area to the left of the mark for 1σ on a standard normal distribution (meaning that the mean = 0 and the standard deviation = 1), we can use the GDC. The area is denoted by P(Z<1σ). In the GDC: 2nd VARS 2: normalcdf(

To find:

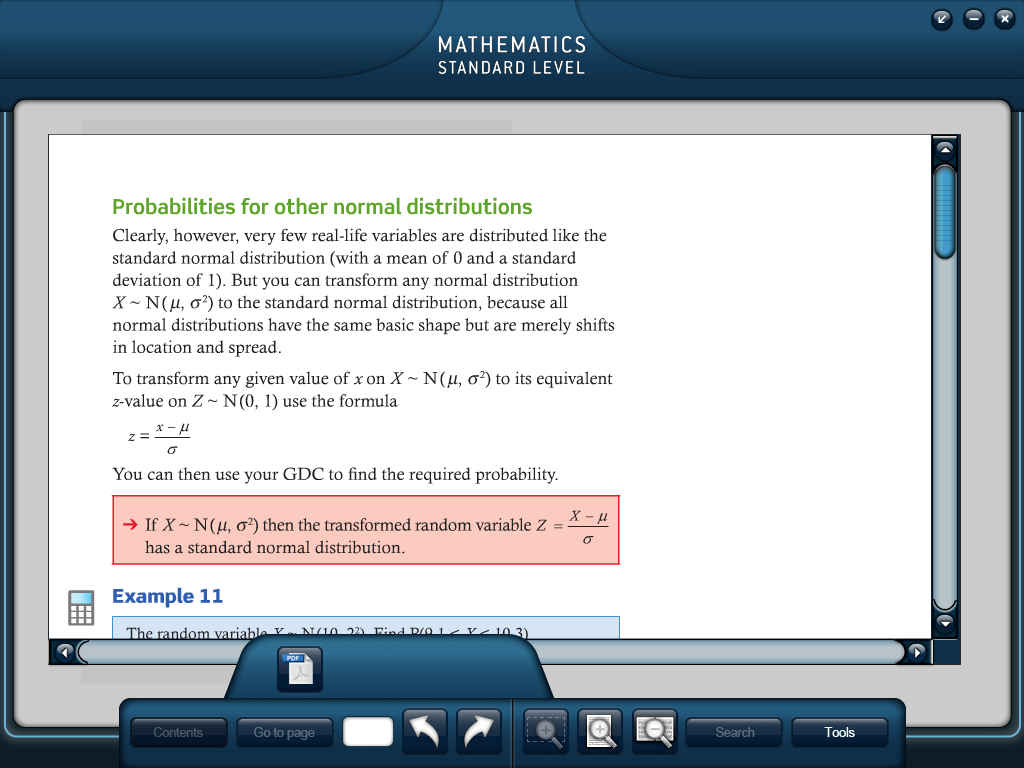
* P(z ≤ a) or P(z < a) use normalcdf (-(# bigger than 5), a)
* P(z ≥ a) or P(z > a) use normalcdf (a, # bigger than 5)
* P(a ≤ z ≤ b) or P(a < z < b) use normalcdf (a, b)

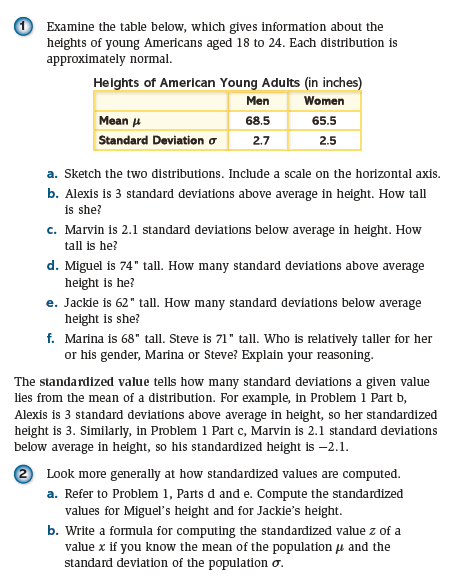
Examples:

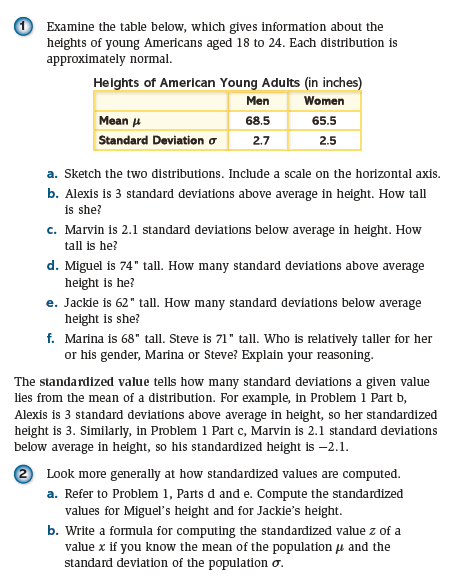
1. Find P(Z < -1.65) 2. Find P(Z > 0.72) 3. Find P(-0.4 < Z < 1.1)

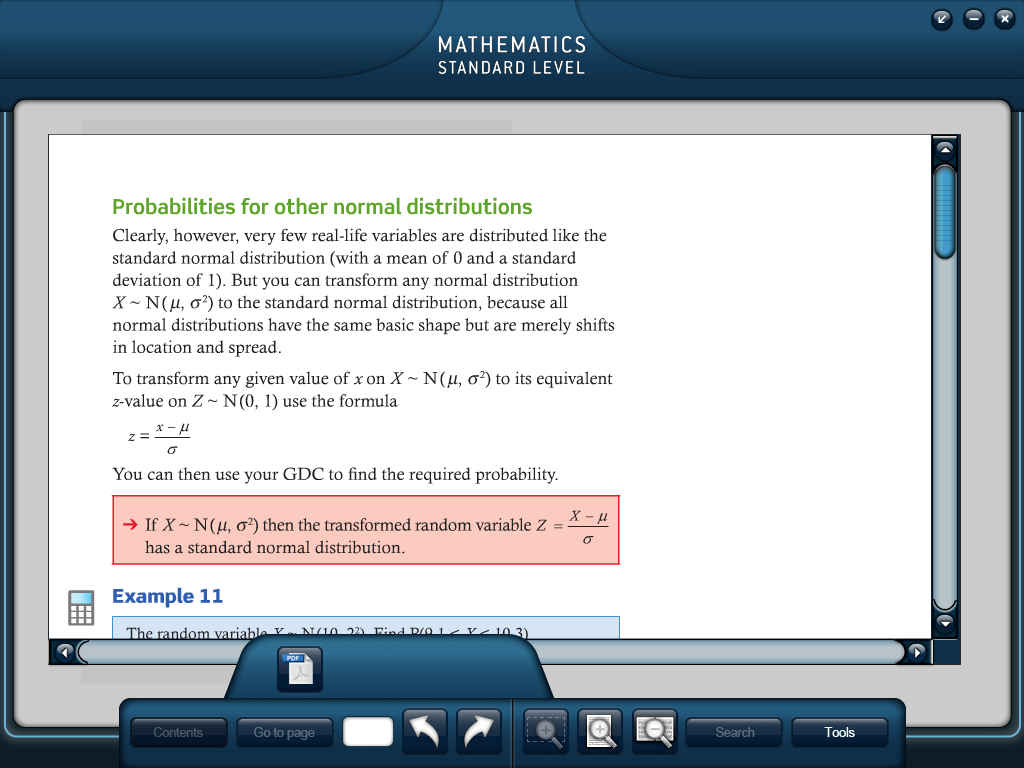
4. Find P(Z > 0.34) 5. Find P(Z ≤ 3) 6. Find P(|Z| < 2.1)

1. **Normal Distribution in the GDC:**









Examples (Note here the use of an X instead of a z):

Find the standardized value (z).

7. If X, find P(X <9.5) 8. If X, find P(X >54.3)

With our GDCs, it simply takes typing in a couple more numbers.

Type: normalcdf (#, #, μ, σ)

Examples (to be done with GDC):

1. If , find P(X > 40) 10. If X, find P(58.5 ≤ X ≤ 71.8)

IB Math SL Unit 5– Day 9 HW Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

