

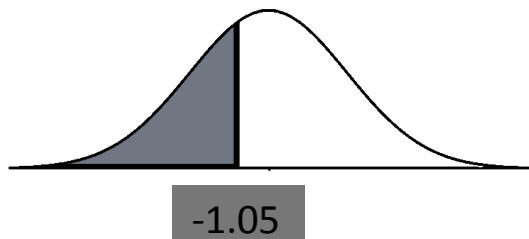
## Standard Normal Distribution

TI Calculator Steps: Calculating area under the standard normal curve between a and b.

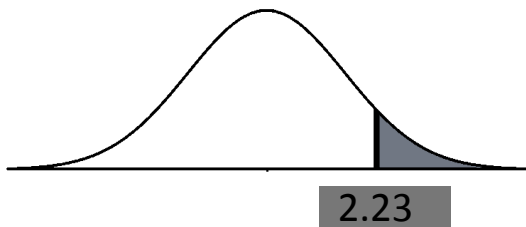
1. Press **2<sup>nd</sup>** then, **VARS** keys to access the DISTR (distributions) menu.
2. Select **normalcdf** and click **ENTER**.
3. Enter the **Lower bound**, **upper bound**, **mean** , and **standard deviation**  $\sigma$ .  
If you have TI 83, then you will have normalcdf(lower bound, upper bound, mean, standard deviation).  
Note: 1. Use -1E99 for negative infinity, and use E99 for positive infinity.  
2. TI calculator has a default mean of 0 and standard deviation of 1. If you don't input the mean and standard deviation, it will use the default values.

### Example:

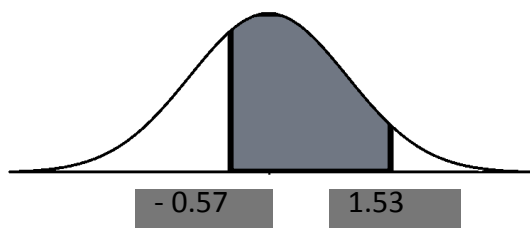
1. Find  $P(Z < -1.05)$ , which is the area under the standard normal curve to the left of  $z = -1.05$ .  
 $P(Z < -1.05) = \text{normalcdf}(-1E99, -1.05, 0, 1) = 0.1469$



2. Find  $P(Z > 2.23)$ , which is the area under the standard normal curve to the right of  $z = 2.23$ .  
 $P(Z > 2.23) = \text{normalcdf}(2.23, E99, 0, 1) = 0.01287$



3. Find  $P(-0.57 < Z < 1.53)$ , the area under the standard normal curve between  $z = -0.57$  and  $z = 1.53$ .  
 $P(-0.57 < z < 1.53) = \text{normalcdf}(-0.57, 1.53, 0, 1) = 0.6527$

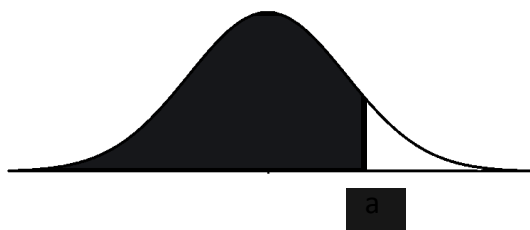


TI Calculator Steps: Find z value from the given area.

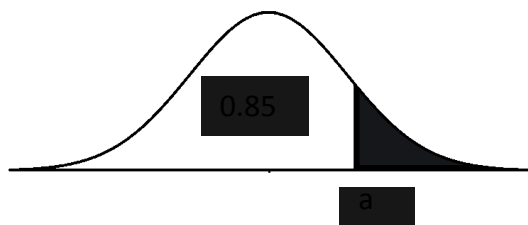
1. Press **2<sup>nd</sup>** then, **VARs** keys to access the DISTR (distributions) menu.
2. Select **invNorm** and click **ENTER**.
3. Enter the **area on the left**, **mean**, **standard deviation  $\sigma$**

Example:

1. Given  $P(z < a) = 0.95$ . Find a  
 $a = \text{invNorm}(0.95, 0, 1) = 1.645$



2. Given  $P(z > a) = 0.15$ . Find a.  
Note: area on the left is  $1 - 0.15 = 0.85$   
 $a = \text{invNorm}(0.85, 0, 1) = 1.036$



**Practice problems:**

1. Use a TI calculator to find the following probabilities.
  - a.  $P(z < 0.56)$
  - b.  $P(z > 1.07)$
  - c.  $P(z < -2.89)$
  - d.  $P(2.00 < z < 3.01)$
  - e.  $P(-0.27 < z < 3.23)$
  - f.  $P(z > 5.56)$
2. Use a TI calculator to find z.
  - a. Given  $P(z < a) = 0.05$ , find a.
  - b. Given  $P(z > a) = 0.825$ , find a.
  - c. Find  $Z_{0.02}$
  - d. Find  $Z_{0.15}$