

**Statistical Reasoning**  
**Normal Distribution - Z-Scores**

Name: Koy

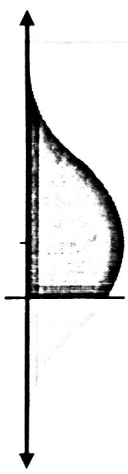
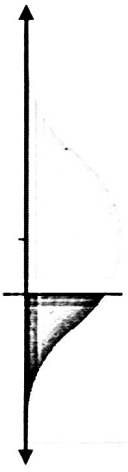
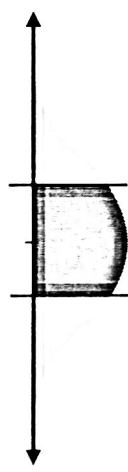
Date: \_\_\_\_\_

Class: \_\_\_\_\_

Calculating Z-Scores: Calculator Mode

$$Z = \frac{x - \bar{x}}{\sigma}$$

$x$  = the given value  
 $\bar{x}$  = the mean  
 $\sigma$  = standard deviation  
 $Z_{table}$  = the Z score from the table

<p style="text-align: center;"><u>Below</u></p> <p>(Less, Under, The Most, Fewer, &lt;)</p> 	<p style="text-align: center;"><u>Above</u></p> <p>(Over, Further, More, &gt;, At Least)</p> 	<p style="text-align: center;"><u>Between</u></p> 
<p>1. And - distr - normalcdf  <math>\mu = 4.9</math> (mean)  <math>\sigma = 0.6</math> (st dev)</p> <p>2. lower = <math>-1 \times 10^{99}</math>                      upper = <math>5.3</math> (values)</p>	<p>1. And - distr - normalcdf  <math>-1 \times 10^{99}</math>    53    60    4</p> <p>2. lower / upper / <math>\mu</math> / <math>\sigma</math></p> <p>3. 0.0401</p> <p>        <u>0.0401 = 0.9599</u></p>	<p>1. And - distr - normalcdf</p> <p>2. lower = 141</p> <p>3. upper = 187</p> <p>4. <math>\mu = 164</math></p> <p>5. <math>\sigma = 23</math></p>
<p>Researchers have determined that the acidity (pH) of rainfall in Michigan is approximately normally distributed with mean 4.9 and standard deviation 0.6.                      What percent of storms produce rainfall with a pH under 5.3?</p> <p><math>P(X &lt; 5.3)</math>  <math>0.7475</math>  <u>74.75%</u></p>	<p>The variable X is normally distributed. The mean is 60.0 and the standard deviation is 4.0. Find <math>P(X &gt; 53.0)</math>.</p> <p><math>P(X &gt; 53)</math>  <math>0.9599</math>  <u>95.99%</u></p>	<p>A class of 203 students participated in a softball throw for distance test. The mean performance of the group was 164 and the standard deviation was 23. What percentage of the students was able to throw the softball between 141 and 187?</p> <p><math>P(141 &lt; X &lt; 187)</math>  <math>0.6827</math>  <u>68.27%</u></p>

\* How high is top 10%?  
 inv Norm .9, 4.9, .6 = about 5.17