

## Continuous Probability Distributions: Summary

	<b>Probability for Individuals or Percentile or Percentages of individuals</b>			<b>Probability for Average or Mean of a Sample</b>
<b>Distribution</b>	<b>Uniform</b>	<b>Exponential</b>	<b>Normal</b>	<b>CLT Normal for Averages</b>
<b>What the problem can ask for</b>	<ul style="list-style-type: none"> <li>•Probability corresponding to given X values, OR</li> <li>•X value corresponding to a given percentile, probability or percentage that represents an area to the right or to the left</li> </ul>	<ul style="list-style-type: none"> <li>•Probability corresponding to given X values</li> </ul>	<ul style="list-style-type: none"> <li>•Probability corresponding to given X or Z values, OR</li> <li>•X or Z value(s) corresponding to a given percentile, probability or percentage that represents an area to the right, to the left, or in the middle</li> </ul>	<ul style="list-style-type: none"> <li>•Probability of an average (mean) for a sample, corresponding to given <math>\bar{x}</math> values</li> </ul> $\text{Use } \bar{X} \sim N\left(\mu, \frac{\sigma}{\sqrt{n}}\right)$
<b>Key words in problem</b>	uniformly distributed	exponential distribution	normally distributed	<ul style="list-style-type: none"> <li>•<b>sample</b></li> <li>•<b>sample size</b></li> <li>•<b>average or mean</b></li> </ul>
<b>Words NOT in problem</b>	<b>sample sample size</b>	<b>sample sample size</b>	<b>sample sample size</b>	<i>usually the symbol <math>\bar{x}</math> does not appear in the problem</i>
<b>Other information given in problem</b>	a and b, which are the minimum and maximum values for the distribution	average or mean: $\mu$ OR rate or decay rate: m	average or mean: $\mu$ and standard deviation: $\sigma$  OR if you are told it is a standard normal, or Z, then you know $\mu = 0$ and $\sigma = 1$	<b>DISTRIBUTION FOR INDIVIDUALS:</b> <ul style="list-style-type: none"> <li>•may be unknown, normal uniform, or exponential.</li> <li>•You will either be given the population <math>\mu</math> and <math>\sigma</math> or you will be given enough information about the distribution for individuals to calculate population <math>\mu</math> and <math>\sigma</math></li> </ul>
<b>Calculation Notes</b>	Use geometry for area of a rectangle to solve problems	<ul style="list-style-type: none"> <li>•Use exponential formulas depending on area to left, right or between</li> <li>•If given <math>\mu</math>, you need to calculate <math>m = 1 / \mu</math></li> <li>•If given rate m, use the value you are given.</li> </ul>	<ul style="list-style-type: none"> <li>•Use <b>normalcdf</b> or <b>nmcdf</b> if given x or z value(s) and finding probabilities</li> <li>•Use <b>invnormal</b> or <b>invnm</b> if given probability and finding x or z values(s)</li> </ul>	$\text{Use } \bar{x} \sim N\left(\mu, \frac{\sigma}{\sqrt{n}}\right),$ <ul style="list-style-type: none"> <li>•<u>For exponential:</u> <math>\mu = \sigma = 1/m</math></li> <li>•<u>For uniform:</u> <math>\mu = \frac{a+b}{2}</math> <math>\sigma = \frac{(b-a)}{\sqrt{12}}</math></li> <li>•<u>For normal or unknown:</u> <math>\mu</math> and <math>\sigma</math> must be given</li> </ul>