

## 6.7: Chapter Key Items

Key Terms	Definition
Normal Distribution	<p>a continuous random variable (<math>RV</math>) with pdf <math>f(x) =</math></p> $\frac{1}{\sigma\sqrt{2\pi}} e^{-\frac{(x-\mu)^2}{2\sigma^2}}$ <p>where <math>\mu</math> is the mean of the distribution and <math>\sigma</math> is the standard deviation; notation: <math>X \sim N(\mu, \sigma)</math>. If <math>\mu = 0</math> and <math>\sigma = 1</math>, the <math>RV</math>, <math>Z</math>, is called the <b>standard normal distribution</b>.</p>
Standard Normal Distribution	<p>a continuous random variable (<math>RV</math>) <math>X \sim N(0, 1)</math>; when <math>X</math> follows the standard normal distribution, it is often noted as <math>Z \sim N(0, 1)</math>.</p>
z-score	<p>the linear transformation of the form <math>z = \frac{x-\mu}{\sigma}</math> or written as <math>z = \frac{ x-\mu }{\sigma}</math>; if this transformation is applied to any normal distribution <math>X \sim N(\mu, \sigma)</math> the result is the standard normal distribution <math>Z \sim N(0, 1)</math>. If this transformation is applied to any specific value <math>x</math> of the <math>RV</math> with mean <math>\mu</math> and standard deviation <math>\sigma</math>, the result is called the z-score of <math>x</math>. The z-score allows us to compare data that are normally distributed but scaled differently. A z-score is the number of standard deviations a particular <math>x</math> is away from its mean value.</p>

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