6.5: Key Terms

Key Terms	Definition
Normal Distribution	a continuous random variable (RV) with pdf $f(x) = \frac{1}{\sigma\sqrt{2\pi}}\mathrm{e}^{\frac{-(x-\mu)^2}{2\sigma^2}}$ where μ is the mean of the distribution and σ is the standard deviation; notation: $X \sim N(\mu, \sigma)$. If $\mu = 0$ and $\sigma = 1$, the RV, Z, is called the **standard normal distribution**.
Standard Normal Distribution	a continuous random variable $(RV) X \sim N(0, 1)$; when X follows the standard normal distribution, it is often noted as $Z \sim N(0, 1)$.
z-score	the linear transformation of the form $z = \frac{x-\mu}{\sigma}$ or written as $z = \frac{\lvert x-\mu \rvert}{\sigma}$; if this transformation is applied to any normal distribution $X \sim N(\mu, \sigma)$ the result is the standard normal distribution $Z \sim N(0, 1)$. If this transformation is applied to any specific value x of the RV with mean μ and standard deviation σ, the result is called the z-score of x. 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 x is away from its mean value.