Formulas

$R(q) = q \cdot D(q)$	$\int_0^{q_0} D(q)dq - q_0 \cdot D(q_0)$	$P(q) = R(q) - C(q)$	$MP(q) = MR(q) - MC(q)$
$f'(x) \cong \frac{f(x+h) - f(x)}{h}$	$E(X) = \sum_{\text{all } x} x \cdot f_X(x)$	$E(X) = \int_{-\infty}^{\infty} x \cdot f_X(x)dx$	$V(X) = \int_{-\infty}^{\infty} (x - \mu_X)^2 \cdot f_X(x)dx$
$E(X) = \frac{a+b}{2}$	$E(X) = np$	$E(X) = \alpha$	$V(X) = \sum_{\text{all } x} (x - \mu_X)^2 \cdot f_X(x)$
$V(X) = \frac{(b-a)^2}{12}$	$V(X) = np(1-p)$	$V(X) = \alpha^2$	$Z = \frac{x - \mu_X}{\sigma_X}$
$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i$	$s = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n}(x_i - \bar{x})^2}$	$\sigma_X = \sqrt{V(X)}$	$Z = \frac{\bar{x} - \mu_X}{\sigma_X/\sqrt{n}}$
$f_X(x) = \begin{cases} 0 & \text{if } x < a \\ \frac{1}{b-a} & \text{if } a \le x \le b \\ 0 & \text{if } x > b \end{cases}$	$f_X(x) = \begin{cases} 0 & \text{if } x < 0 \\ \frac{1}{\alpha} e^{-x/\alpha} & \text{if } x \ge 0 \end{cases}$	$f_X(x) = \frac{1}{\sigma_X\sqrt{2\pi}} e^{-0.5\left(\frac{x-\mu_X}{\sigma_X}\right)^2}$	$\sigma_{\bar{x}} = \frac{\sigma_X}{\sqrt{n}}$
$F_X(x) = \begin{cases} 0 & \text{if } x < a \\ \frac{x-a}{b-a} & \text{if } a \le x < b \\ 1 & \text{if } x \ge b \end{cases}$	$F_X(x) = \begin{cases} 0 & \text{if } x < 0 \\ 1 - e^{-x/\alpha} & \text{if } x \ge 0 \end{cases}$	$f_Z(z) = \frac{1}{\sqrt{2\pi}} e^{-0.5z^2}$	$(\bar{x} - 1.96\frac{\sigma_X}{\sqrt{n}}, \bar{x} + 1.96\frac{\sigma_X}{\sqrt{n}})$

Function:	**Derivative:**	**General Rules**
$f(x) = a$	$f'(x) = 0$	$\frac{d}{dx}(af(x)) = af'(x)$
$f(x) = x$	$f'(x) = 1$	$\frac{d}{dx}(f(x) + g(x)) = f'(x) + g'(x)$
$f(x) = x^2$	$f'(x) = 2x$	$\frac{d}{dx}(f(x) \cdot g(x)) = f'(x)g(x) + f(x)g'(x)$
$f(x) = x^n$	$f'(x) = nx^{n-1}$	
$f(x) = e^{ax}$	$f'(x) = ae^{ax}$	
$f(x) = \ln(x)$	$f'(x) = \frac{1}{x}$	Note: a and n are constants

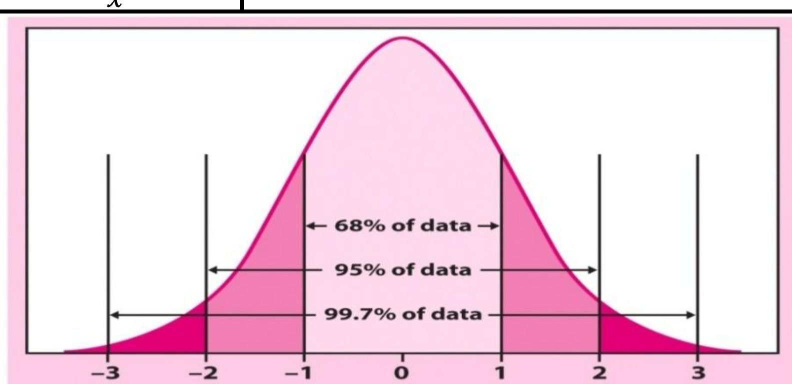

Figure 13-8
Statistics: Concepts and Controversies, Sixth Edition