Formula Sheet – Test 1

$$s^2 = \frac{\sum_{i=1}^{n} x_i^2 - \left(\sum_{i=1}^{n} x_i\right)^2 \Big/ n}{n-1}$$

$$\mu = E(x) = \sum x f(x)$$

$$\sigma^2 = V(X) = \sum_x x^2 f(x) - \mu^2$$

$$p(x) = \binom{n}{x} p^x (1-p)^{n-x}$$

$$\mu = E(X) = np$$

$$\sigma^2 = V(X) = np(1-p)$$

$$p(x) = \frac{e^{-\lambda}\lambda^x}{x!}$$

$$p(x) = \frac{\binom{D}{x}\binom{N-D}{n-x}}{\binom{N}{n}}$$

$$\mu = E(X) = np$$

$$\sigma^2 = V(X) = np(1-p)\left(\frac{N-n}{N-1}\right)$$

$$\mu = E(X) = \lambda$$

$$\sigma^2 = V(X) = \lambda$$

$$z = \frac{x-\mu}{\sigma}$$

$$P(a \le x \le b) = \Phi\left(\frac{b-\mu}{\sigma}\right) - \Phi\left(\frac{a-\mu}{\sigma}\right)$$

$$Z = \frac{X - np}{\sqrt{np(1-p)}}$$

$$P(X = a) = \Phi\left(\frac{a+0.5-np}{\sqrt{np(1-p)}}\right) - \Phi\left(\frac{a-0.5-np}{\sqrt{np(1-p)}}\right)$$

$$P(a \le X \le b) = \Phi\left(\frac{b+0.5-np}{\sqrt{np(1-p)}}\right) - \Phi\left(\frac{a-0.5-np}{\sqrt{np(1-p)}}\right)$$

$$Z = \frac{X-\lambda}{\sqrt{\lambda}}$$

$$P(X = a) = \Phi\left(\frac{a+0.5-\lambda}{\sqrt{\lambda}}\right) - \Phi\left(\frac{a-0.5-\lambda}{\sqrt{\lambda}}\right)$$

$$P(a \le X \le b) = \Phi\left(\frac{b+0.5-\lambda}{\sqrt{\lambda}}\right) - \Phi\left(\frac{a-0.5-\lambda}{\sqrt{\lambda}}\right)$$

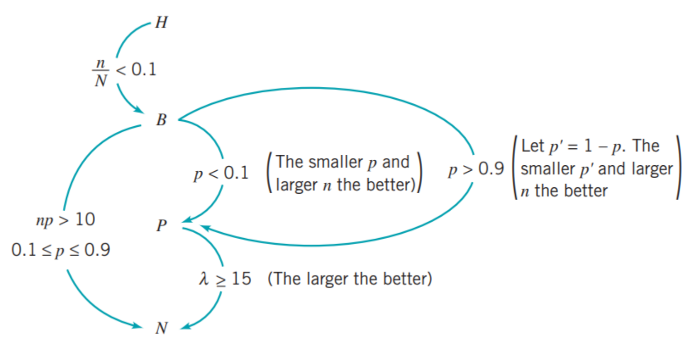

FIGURE 3.29 Approximations to probability distributions.

Summary of One-Sample Hypothesis-Testing Procedures

Case	Null Hypothesis	Test Statistic	Alternative Hypothesis	Fixed Significance Level Criteria for Rejection
1.	$H_0: \mu = \mu_0$ σ^2 known	$z_0 = \dfrac{\overline{x} - \mu_0}{\sigma/\sqrt{n}}$	$H_1: \mu \neq \mu_0$	$\lvert z_0 \rvert > z_{\alpha/2}$
			$H_1: \mu > \mu_0$	$z_0 > z_\alpha$
			$H_1: \mu < \mu_0$	$z_0 < -z_\alpha$
2.	$H_0: \mu = \mu_0$ σ^2 unknown	$t_0 = \dfrac{\overline{x} - \mu_0}{s/\sqrt{n}}$	$H_1: \mu \neq \mu_0$	$\lvert t_0 \rvert > t_{\alpha/2,n-1}$
			$H_1: \mu > \mu_0$	$t_0 > t_{\alpha,n-1}$
			$H_1: \mu < \mu_0$	$t_0 < -t_{\alpha,n-1}$
3.	$H_0: \sigma^2 = \sigma_0^2$	$x_0^2 = \dfrac{(n-1)s^2}{\sigma_0^2}$	$H_1: \sigma^2 \neq \sigma_0^2$	$\chi_0^2 > \chi_{\alpha/2,n-1}^2$ or $\chi_0^2 < \chi_{1-\alpha/2,n-1}^2$
			$H_1: \sigma^2 > \sigma_0^2$	$\chi_0^2 > \chi_{\alpha,n-1}^2$
			$H_1: \sigma^2 < \sigma_0^2$	$\chi_0^2 < \chi_{1-\alpha,n-1}^2$
4.	$H_0: p = p_0$	$z_0 = \dfrac{x - np_0}{\sqrt{np_0(1-p_0)}}$	$H_1: p \neq p_0$	$\lvert z_0 \rvert > z_{\alpha/2}$
			$H_1: p > p_0$	$z_0 > z_\alpha$
			$H_1: p < p_0$	$z_0 < -z_\alpha$