

Chapter 2

$$s^2 = \frac{\sum(x - \bar{x})^2}{n - 1} = \frac{\sum x^2 - (\sum x)^2/n}{n - 1} \quad s = \sqrt{s^2}$$

Q1 - 1.5 IQR Q3 + 1.5 IQR

$$68\% : \mu \pm \sigma \quad 95\% : \mu \pm 2\sigma \quad 99.7\% : \mu \pm 3\sigma$$

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

Chapter 3

$$r = \frac{\frac{1}{n-1} \sum(x - \bar{x})(y - \bar{y})}{s_x s_y} = \frac{\sum z_x z_y}{n - 1}$$

$$b = \frac{\sum(x - \bar{x})(y - \bar{y})}{\sum(x - \bar{x})^2} = \frac{r s_y}{s_x} \quad a = \bar{y} - b\bar{x} \quad \hat{y} = a + bx$$

Chapter 5

$$P(A|B) = \frac{P(A \text{ and } B)}{P(B)}$$

Chapter 6

$$Z = \frac{X - \mu}{\sigma} \quad X = \mu + \sigma Z$$

$$P(x) = \frac{n!}{x!(n-x)!} p^x (1-p)^{n-x} \quad \mu = np \quad \sigma = \sqrt{np(1-p)}$$

$$Z = \frac{\bar{X} - \mu_{\bar{X}}}{\sigma_{\bar{X}}} = \frac{\bar{X} - \mu}{\sigma/\sqrt{n}} \quad Z = \frac{\hat{p} - \mu_{\hat{p}}}{\sigma_{\hat{p}}} = \frac{\hat{p} - p}{\sqrt{p(1-p)/n}}$$

Chapter 7

$$\hat{p} \pm z \sqrt{\hat{p}(1-\hat{p})/n} \quad n = \hat{p}(1-\hat{p})(z/m)^2 \quad n = 0.25 (z/m)^2$$

$$\bar{X} \pm t_{n-1} s/\sqrt{n} \quad n = (z s/m)^2$$

Chapter 8

$$T_{n-1} = \frac{\bar{X} - \mu}{s/\sqrt{n}}$$

Chapter 9

$$Z = \frac{\hat{p}_1 - \hat{p}_2 - 0}{\sqrt{\hat{p}(1-\hat{p})(1/n_1 + 1/n_2)}} \quad \hat{p}_1 - \hat{p}_2 \pm z \sqrt{\hat{p}_1(1-\hat{p}_1)/n_1 + \hat{p}_2(1-\hat{p}_2)/n_2}$$

$$T = \frac{\bar{X}_1 - \bar{X}_2 - (\mu_1 - \mu_2)}{\sqrt{s_1^2/n_1 + s_2^2/n_2}} \quad \bar{X}_1 - \bar{X}_2 \pm t \sqrt{s_1^2/n_1 + s_2^2/n_2}$$

Chapter 10

$$X^2 = \sum \frac{(\text{observed count} - \text{expected count})^2}{\text{expected count}}$$