

Formula Sheet

$$\bar{x} = \frac{x_1 + x_2 + \dots + x_n}{n} \quad s = \sqrt{\frac{(x_1 - \bar{x})^2 + (x_2 - \bar{x})^2 + \dots + (x_n - \bar{x})^2}{n-1}} \quad M = \left(\frac{n+1}{2}\right) \text{term} \quad z = \frac{x - \mu}{\sigma}$$

Test Statistics

$$z = \frac{\bar{x} - \mu}{\sigma / \sqrt{n}} \quad t = \frac{\bar{x} - \mu}{s / \sqrt{n}} \quad \text{df} = n-1 \quad t = \frac{(\bar{x}_1 - \bar{x}_2) - 0}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}} \quad \text{df} = \min(n_1-1, n_2-1)$$

$$t = \frac{(\bar{x}_1 - \bar{x}_2) - 0}{s_p \sqrt{\frac{1}{n_1} + \frac{1}{n_2}}} \quad \text{df} = n_1 + n_2 - 2 \quad s_p = \sqrt{\frac{(n_1 - 1)s_1^2 + (n_2 - 1)s_2^2}{n_1 + n_2 - 2}}$$

$$z = \frac{\hat{p} - p}{\sqrt{\frac{p(1-p)}{n}}} \quad \tilde{p} \pm z * \sqrt{\frac{\tilde{p}(1-\tilde{p})}{n+4}} \quad \tilde{p} = \frac{x+2}{n+4}$$

Rcodes:

```
read.table('filename.csv', sep=',', header=TRUE)
hist(dat$x)
boxplot(dat$x)
summary(dat$x)
plot(dat$x, dat$y)
lm.model <- lm(dat$y ~ dat$x)
summary(lm.model)
plot(dat$x, lm.model$residuals)
cor(dat$x, dat$y)
```

```
mean(dat$x)
sd(dat$x)
pnorm(zcalc)
qnorm(0.25)
pt(tcalc, df)
qt(value, df, lower.tail=FALSE)
```