Formula sheet for midterm

$$\frac{\overline{Y} - \mu}{\frac{s}{\sqrt{n}}} \sim t_{n-1} \qquad \overline{Y} \pm t_{n-1}(0.975) \times \mathrm{SE}_{\overline{Y}}$$

$$\frac{(\overline{Y_2} - \overline{Y_1}) - (\mu_2 - \mu_1)}{s_p\sqrt{1/n_1 + 1/n_2}} \sim t_{n_1+n_2-2}$$

$$s_p = \sqrt{\frac{(n_1-1)s_1^2 + (n_2-1)s_2^2}{n_1+n_2-2}}$$

$$(\overline{Y_2} - \overline{Y_1}) \pm t_{n_1+n_2-2}(0.975) \times \mathrm{SE}_{\overline{Y_2}-\overline{Y_2}}$$

`pt(x, df)` - the area to the left of the number *x* under a Student's t-distribution with *df* degrees of freedom

`qt(p, df)` - the number such that the area *p* falls to the left of it under a Student's t-distribution with *df* degrees of freedom

median(Y_2) ≈ median(Y_1) exp($\overline{Z}_2$ - $\overline{Z}_1$) where $Z_2 = \log(Y_2)$ and $Z_1 = \log(Y_1)$

Wilcoxon rank-sum test: T = (sum of the ranks in the smaller group)

Wilcoxon signed rank test: S = (sum of the ranks of the positive differences)

Levene's test: Two-sample t-test on: $Z_1 = (Y_1 - \overline{Y}_1)^2$ & $Z_2 = (Y_2 - \overline{Y}_2)^2$