Ex 4
8.2
23) a) $\hat{p} = \frac{wsu}{\#} = \frac{24}{37}$ $\left[\frac{\hat{\theta} - \theta}{sd_{\hat{\theta}}} \sim N(0,1) \right]$

(8.10) p. 395 $\Rightarrow$ (0.438, 0.814) $n = 37$, $\alpha = 0.01$

b) CI = (l, u) $u - l \leq 0.10$

se 8.12 p 397 $\Rightarrow$ $w = 0.10$

$\underline{n = 659}$

(evt:) (8.10)

$$z_{\alpha/2} \frac{\sqrt{\hat{p}\hat{q}/n + z_{\alpha/2}^2/4n^2}}{1 + z_{\alpha/2}^2/n} \cdot 2 \leq 0.10$$

sep 15-12:12

26) $Z = \frac{\bar{x} - \lambda}{\sqrt{\frac{\lambda}{n}}} \sim N(0,1)$

$P\left(-z_{\alpha/2} < \frac{\bar{x}-\lambda}{\sqrt{\frac{\lambda}{n}}} < z_{\alpha/2}\right) \approx 1 - \alpha$

$\frac{\bar{x}-\lambda}{\sqrt{\frac{\lambda}{n}}} = z_{\alpha/2} \Rightarrow \lambda^2 - \left(2\bar{x} + \frac{z_{\alpha/2}^2}{n}\right)\lambda + \bar{x}^2 = 0$

ok: $\lambda = \frac{2\bar{x} + \frac{z_{\alpha/2}^2}{n} \pm \sqrt{\left(2\bar{x} + \frac{z_{\alpha/2}^2}{n}\right)^2 - 4\bar{x}^2}}{2}$

$= \bar{x} + \frac{z_{\alpha/2}^2}{2n} \pm \frac{1}{2} \frac{z_{\alpha/2}}{n} \sqrt{4\bar{x}n + z_{\alpha/2}^2}$

$\Rightarrow (3.54, 4.66)$

sep 15-12:30

8.3
33) a) qqnorm i R

b) CI $\bar{x} \pm t_{\alpha/2, n-1} \frac{s}{\sqrt{n}}$

$\bar{x} = 38.267$, $s = 0.2646$, $n = 16$, $\alpha = 0.05$

$\Rightarrow$ (38.08, 38.46)

c) $F = 1.8C + 32 \Rightarrow$ (100.5, 101.2) ... (?)

Yes! fordi: 38 C° < CI

34) $\underline{\text{se } 33}$

sep 15-12:38

37) $\bar{x} = 370.69$ $s = 24.36$ $n = 26$ $\alpha = 0.05$

a) upper C-B $\bar{x} + t_{\alpha, n-1} \frac{s}{\sqrt{n}} = \underline{378.85}$

b) upper P-B $\bar{x} + t_{\alpha, n-1} s \sqrt{1 + \frac{1}{n}} = \underline{413.14}$

c) $\bar{x}$, $\bar{x}_{new}$ $\Rightarrow$ PI $\frac{\bar{x} - \bar{x}_{new} - 0}{\sqrt{Var[\bar{x} - \bar{x}_{new}]}} = Z \sim N(0,1)$

$Var[\bar{x} - \bar{x}_{new}] = Var[\bar{x}] + Var[\bar{x}_{new}]$

$= \frac{\sigma^2}{n} + Var[(x_{27} + x_{28})/2] = \frac{\sigma^2}{n} + \frac{1}{4}\left(Var[x_{27}] + Var[x_{28}]\right)$

$= \frac{\sigma^2}{n} + \frac{\sigma^2}{2} = \sigma^2\left(\frac{1}{2} + \frac{1}{n}\right)$

$P(-t_{\alpha/2, n-1} < Z < t_{\alpha/2, n-1}) = 1 - \alpha$

$\Rightarrow$ PI for $\bar{x}_{new}$: $\bar{x} \pm t_{\alpha/2, n-1} s \sqrt{\frac{1}{2} + \frac{1}{n}}$

$= (340.16, 401.22)$

sep 15-12:52

8.4
46) 99 CI for σ $\frac{(n-1)s^2}{\sigma^2} \sim \chi^2_{n-1}$ fordi $X_i \sim N$

Fra (8.17): $\frac{(n-1)s^2}{\chi_{\alpha/2, n-1}} < \sigma^2 < \frac{(n-1)s^2}{\chi_{1-\alpha/2, n-1}}$

CI σ^2: (3.5626, 20.0356) $s^2 = 7.734$, $n = 20$

σ : $(\sqrt{l}, \sqrt{u}) \Rightarrow \underline{(1.89, 4.48)}$

Krever at X_i er N

sep 15-13:26

47) a) qqnorm i R $\Rightarrow$ c.a. N

b) 95% CI (ex. 46) $\Rightarrow$ (2.34, 5.60)

c) ... ?

sep 15-13:34