Math 166 HW 7

1 From the samples, calculated $\bar{y} = 1.426$ and $S_y = 0.056$.

For $\alpha = 0.1$ confidence interval, have the equation: $\left(1.426 - \frac{0.056}{\sqrt{20}} t_{0.05,19},\ 1.426 + \frac{0.056}{\sqrt{20}} t_{0.05,19}\right)$

$t_{0.05,19} = 1.7291$

$\boxed{CI = (1.403,\ 1.448)}$

2 $\bar{y} = 193.54$, $S_y = 51.189$, have $\alpha = 0.1$ w/ $n = 24$ have the CI:

$\left(193.54 - \frac{51.59}{\sqrt{24}} t_{0.05,23},\ 193.54 + \frac{51.59}{\sqrt{24}} t_{0.05,23}\right)$

$t_{0.05,23} = 1.7139$

$\boxed{CI: (175.386,\ 211.694)}$

The above 90% confidence interval of (175.386, 211.694) lies above the "normal" platelet count

3a) $S_y = 16.17$, $n = 24$ $\bar{y} = 11.5$, $\mu = 10.1$

$$\frac{\bar{y} - \mu}{S_y/\sqrt{n}} = \frac{11.5 - 10.1}{16.17/\sqrt{24}} = 0.674$$

$t_{0.05,23} = 1.7139 > 0.674$, so we fail to reject H_0

b) $H_0: \sigma^2 = 15.67$ vs $H_1: \sigma < 15.67$

$$\chi^2 = \frac{(n-1)\, s_y^2}{\sigma_y^2} = \frac{23(10.17)^2}{(15.67)^2} = 9.688$$

$$\chi^2_{0.05,23} = 13.091 \quad \text{found} = \sqrt{\frac{23(10.17)^2}{(1.731\ldots)}}$$

since $\chi^2 < \chi^2_{0.05,23}$ we reject the null hypothesis that $H_0: \sigma = 15.67$