3.

h) The width of the 95% confidence interval for μ with σ unknown that you reported in b) is 10.17295, which is obtained by $2 * 2.093024 * \frac{10.8682}{\sqrt{20}}$ based on part b).

i) Professor Stringer should have filled up car S for 204 times if he wanted his confidence intervals to have width 3 litres, assuming σ is unknown.

j) I) $\bar{y} \pm bs\sqrt{1+\frac{1}{n}}$, where b is given by P($T \leq b$) = $\frac{1+p}{2}$ where $T \sim t(n-1)$, s is the sample standard deviation, and n is the number of observed data, $\bar{y}$ is the sample mean. This interval for the gasS data is from 23.55075 to 70.16905.

II) The average empirical coverage probability of the interval is 0.9488.