$E(\bar{x}) = u$

6.4

$V(\bar{x}) = \dfrac{\delta^2}{n} = E(\bar{x}^2) - u^2$

$E(\hat{\theta_1}) = E\left(\dfrac{\sum\limits_{i=1}^{n}(x_i-\bar{x})^2}{n}\right) = \dfrac{1}{n}E\left(\sum\limits_{i=1}^{n}x_i^2 - n\bar{x}^2\right)$

$= \dfrac{1}{n}(n\delta^2 + nu^2 - \delta^2 - nu^2) = \dfrac{n-1}{n}\delta^2$

$E(\hat{\theta_2}) = E\left(\dfrac{\sum\limits_{i=1}^{n}(x_i-\bar{x})^2}{n-1}\right) = \dfrac{1}{n-1}E\left(\sum\limits_{i=1}^{n}x_i^2 - n\bar{x}^2\right) = \dfrac{1}{n-1}(n\delta^2 + nu^2 - \delta^2 - nu^2) = \delta^2$