STA302 HW1, question 8 - Answer template

Name: Your name

Autumn 2017. Remember (a) is done for you already

(a): Show that $\sum_i^n (X_i - \bar{X}) = 0$

Answer:

$$\begin{aligned}\sum_{i=1}^{n}(X_i - \bar{X}) &= \sum_{i=1}^{n} X_i - \sum_{i=1}^{n} \bar{X} \\ &= \sum_{i=1}^{n} X_i - n\bar{X} \\ &= \sum_{i=1}^{n} X_i - \sum_{i=1}^{n} X_i \\ &= 0\end{aligned}$$

(b): Show that $\sum_i^n (X_i - \bar{X})^2 = \sum_{i=1}^n X_i^2 - n\bar{X}^2$

Answer:

$$\begin{aligned}\sum_{i}^{n}(X_i - \bar{X})^2 &= \ldots \\ &= \ldots \\ &= \ldots \\ &= \ldots\end{aligned}$$

(c): Show that $\sum_i^n (X_i - \bar{X})(Y_i - \bar{Y}) = \sum_{i=1}^n X_i Y_i - n\bar{X}\bar{Y}$

Answer:

$$\begin{aligned}\sum_{i}^{n}(X_i - \bar{X})(Y_i - \bar{Y}) &= \ldots \\ &= \ldots \\ &= \ldots \\ &= \ldots\end{aligned}$$