

6.1

#13. First we need to find $\mu = E(X)$ for the population. By integrating (too hard to show here) we get $E(X) = \theta/3$.

Now we need $E(3\bar{X}) = 3 E(\sum X/n) = 3/n * \sum E(X) = 3/n * \sum \theta/3 = 3/n * n\theta/3 = \theta$, as desired.

#15a. We first find $E(\sum X^2) = \sum E(X^2) = \sum 2\theta = n2\theta$. Dividing through by $2n$ we get that $E(\sum X^2/(2n)) = n2\theta/2n = \theta$. That makes $\sum X^2/(2n)$ an unbiased estimator for θ .