Lab 1 - TDDE07

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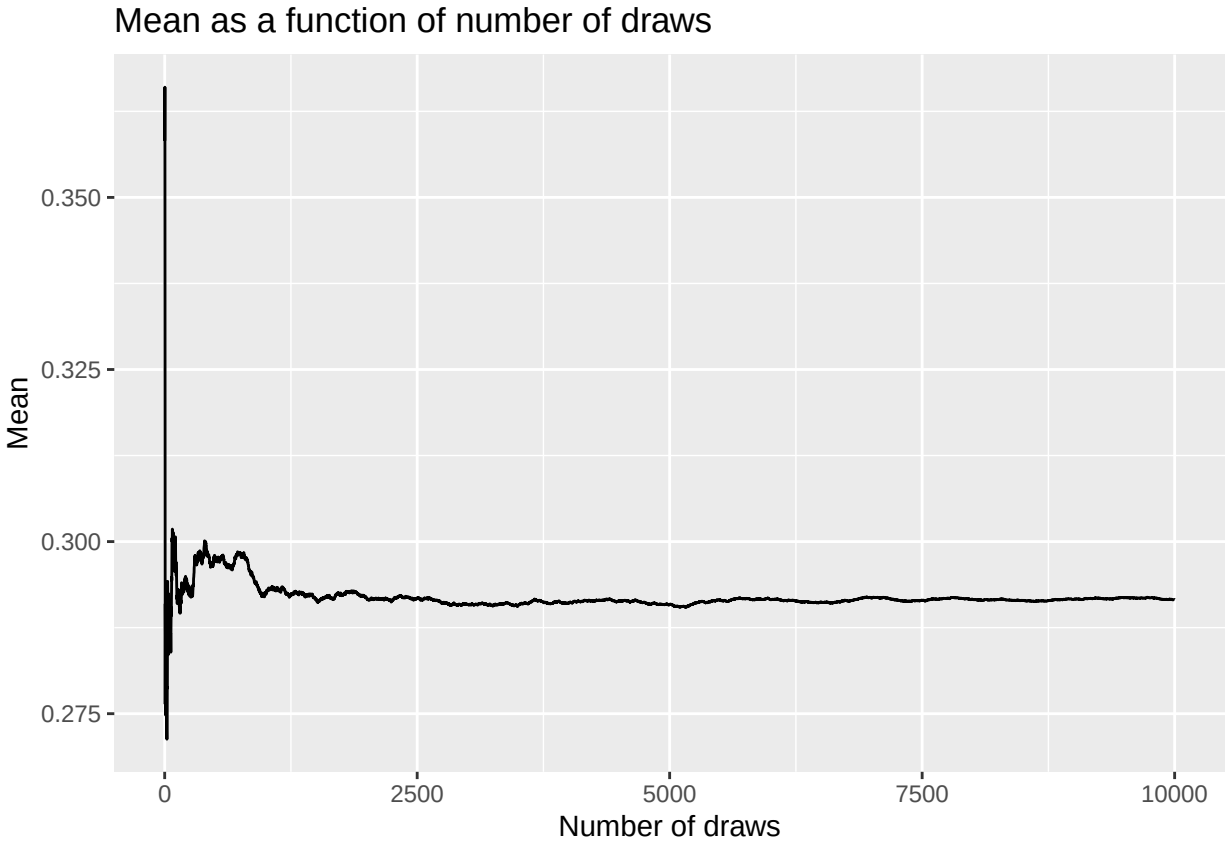
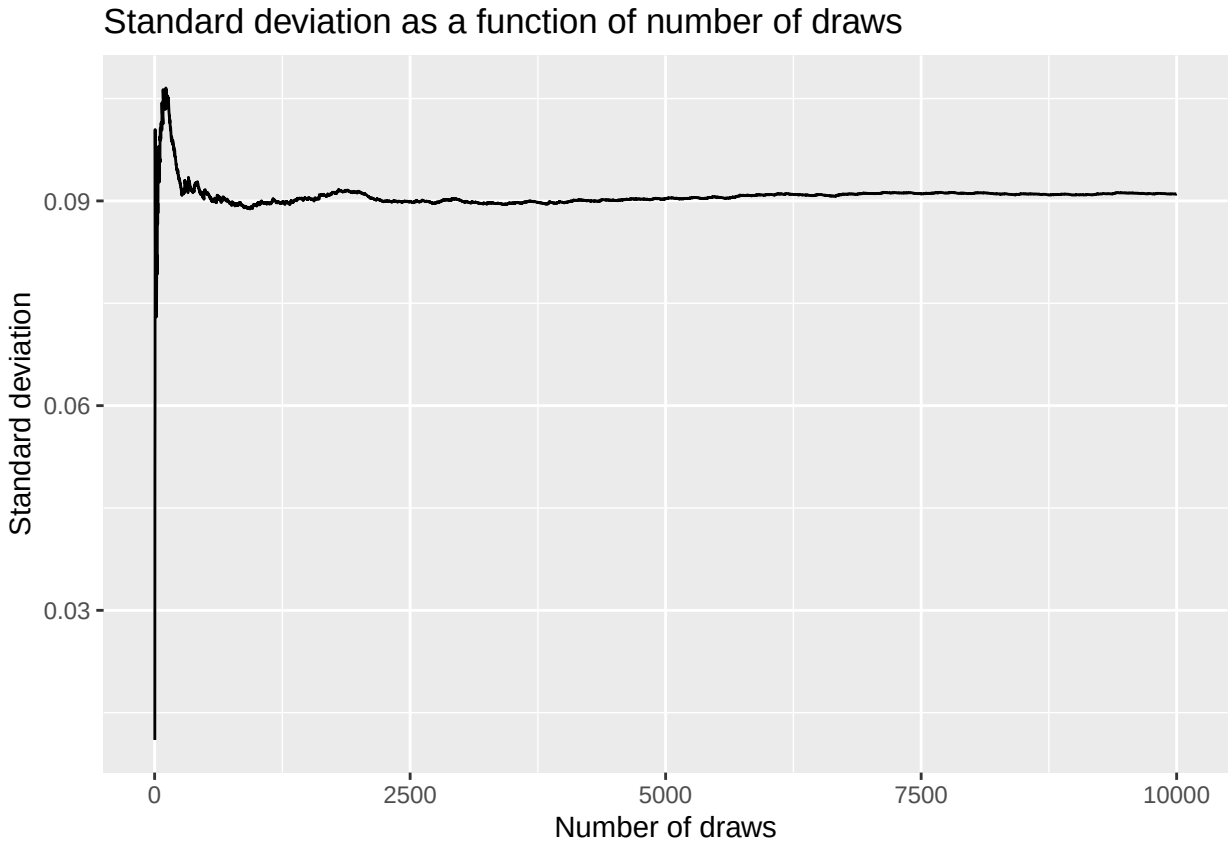
1.

a)



Above is a graph that shows the mean as a function of the number of draws. As one can see it converges to about 0.292. To calculate the true value for the mean of the posterior the following values are used $\alpha = \alpha_o + s = 2 + 5$ and $\beta = \beta_0 + f = 2 + 15$ and the formula to calculate the mean of a beta distribution is $E(\theta|y) = \alpha/(\alpha + \beta)$ where $\theta|y \sim Beta(a_0 + s, b_0 + f) = Beta(7, 17)$. The true value of the mean is 0.2917.



Above is a graph that shows the standard deviation as a function of the number of draws. As one can see it converges to about 0.091. To calculate the true value for the standard deviation of the posterior the following values are used $\alpha = \alpha_o + s = 2 + 5$ and $\beta = \beta_0 + f = 2 + 15$ and the formula to calculate the standard deviation of a beta distribution is $SD(\theta|y) = \sqrt{V(\theta|y)} = \sqrt{\alpha\beta/((\alpha+\beta)^2(\alpha+\beta+1))}$ where $\theta|y \sim Beta(a_0 + s, b_0 + f) = Beta(7, 17)$. The true value of the standard deviation is 0.0901.