DATA130004: Homework 7

Due in class on December 1, 2016

1. Exercise 9.1
2. Exercise 9.2
3. Exercise 9.3
4. Exercise 9.4
5. Exercise 9.5
6. Suppose that if $\theta = 1$, then Y has a normal distribution with mean 1 and standard deviation σ, and if $\theta = 2$, then Y has a normal distribution with mean 2 and standard deviation σ. Also, suppose $\mathrm{P}(\theta = 1) = P(\theta = 2) = 0.5$.
   (a) For $\sigma = 2$, write the formula for the marginal probability density for Y and sketch it.
   (b) What is $\mathrm{P}(\theta = 1|Y = 1)$, again supposing $\sigma = 2$?
   (c) Describe how the posterior density of θ changes in shape as σ is increased and as it is decreased.