HW1

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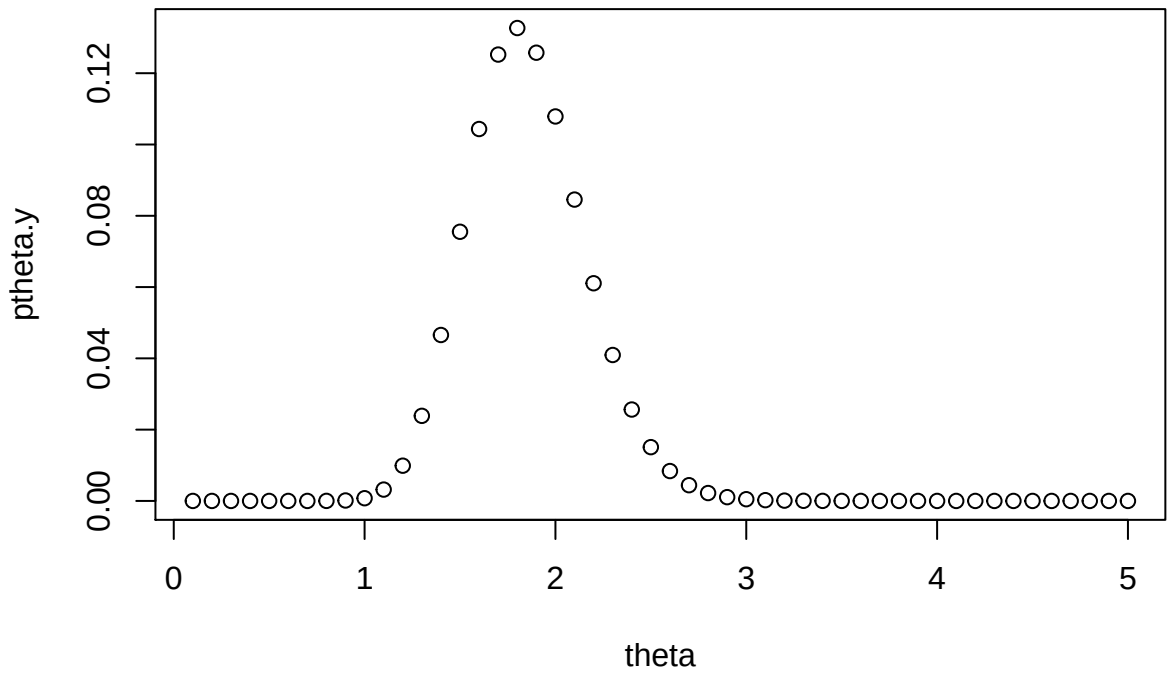
9/11/2020

3b)

```
n <- 20
y <- 36
theta <- seq(0.1, 5, length = 50)
py.theta <- dpois(y, lambda = n*theta)
ptheta <- rep(1/50, length = length(theta))
ptheta.y <- py.theta * ptheta/sum(py.theta * ptheta)
plot(theta, ptheta.y)
```



3c)

```
exptheta.y <- (1+y)/(1+n)
exptheta.y
```

```
## [1] 1.761905
```

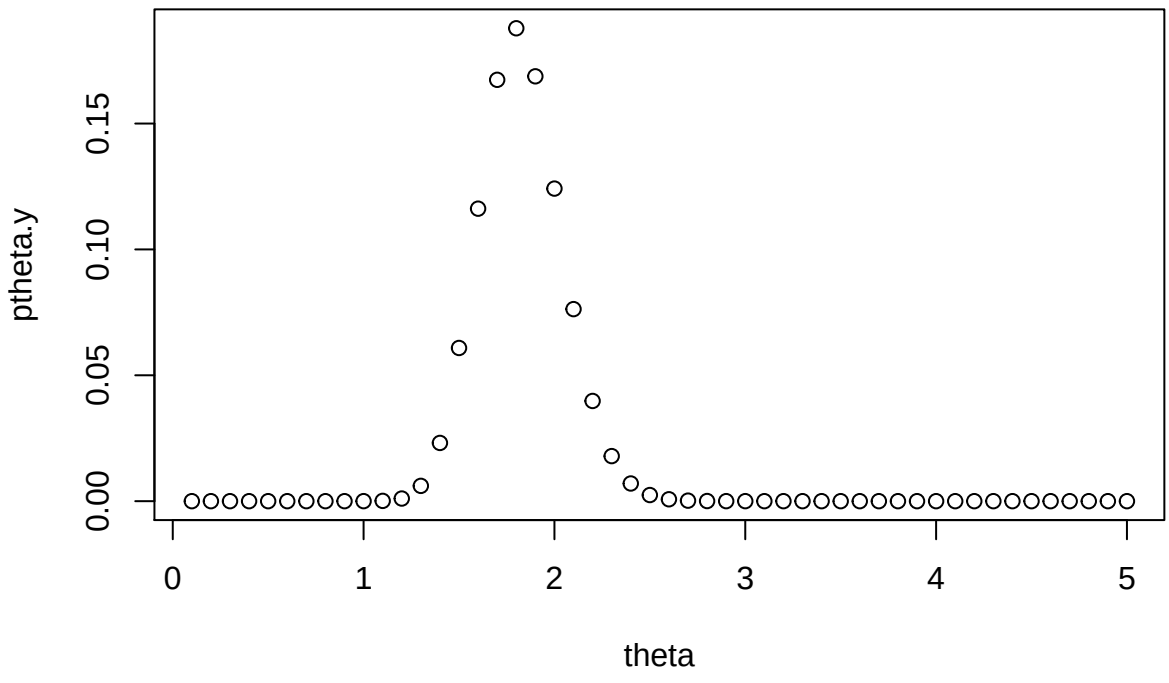
3d)

```
qgamma(c(.025, .975), 1+y, 1+n)
```

```
## [1] 1.240544 2.373294
```

3e)

```
n <- 40
y <- 72
theta <- seq(0.1, 5, length = 50)
py.theta <- dpois(y, lambda = n*theta)
ptheta <- rep(1/50, length = length(theta))
ptheta.y <- py.theta * ptheta/sum(py.theta * ptheta)
plot(theta, ptheta.y)
```



Comparing this plot to the plot from part b, we can see that we have a narrower probability distribution. Since we've observed a higher number of observations, this gives us more information about our expected value of theta given our sampling methods and thus our probability is more concentrated around the mean.