

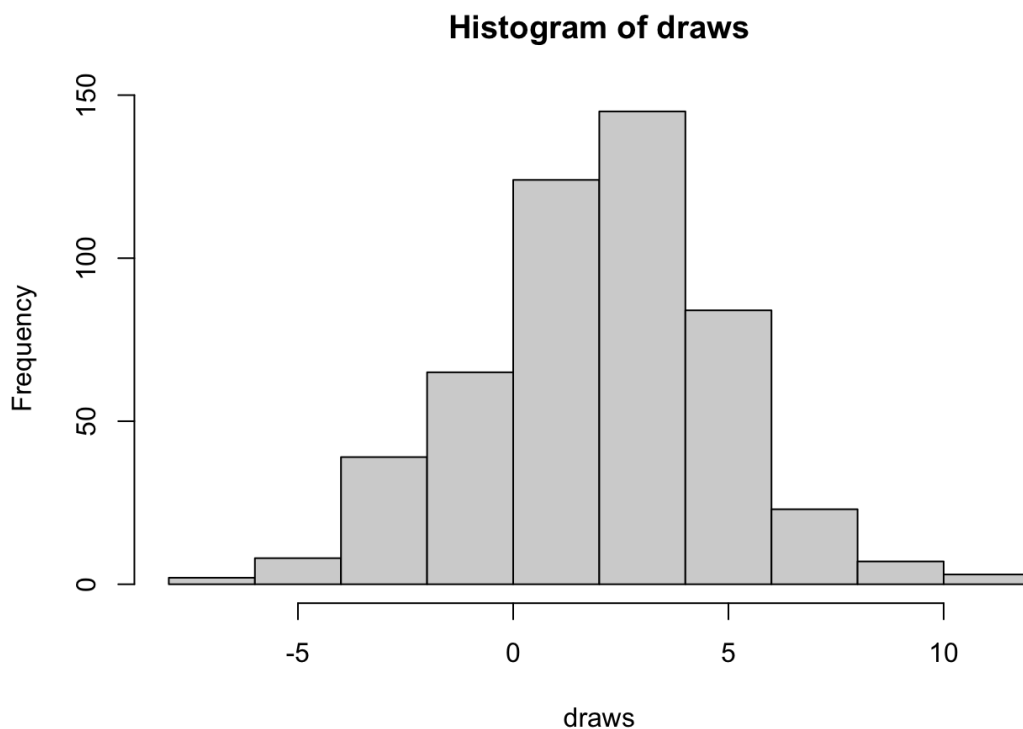
Assignment 1

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1. Take 500 draws from a normal distribution that has an expected value of 2 and a variance of 9. Make a histogram of these 500 draws.

```
draws<-rnorm(500, mean = 2, sd = sqrt(9))  
hist(draws)
```



2. Calculate the sample mean from the 500 draws from problem 1.

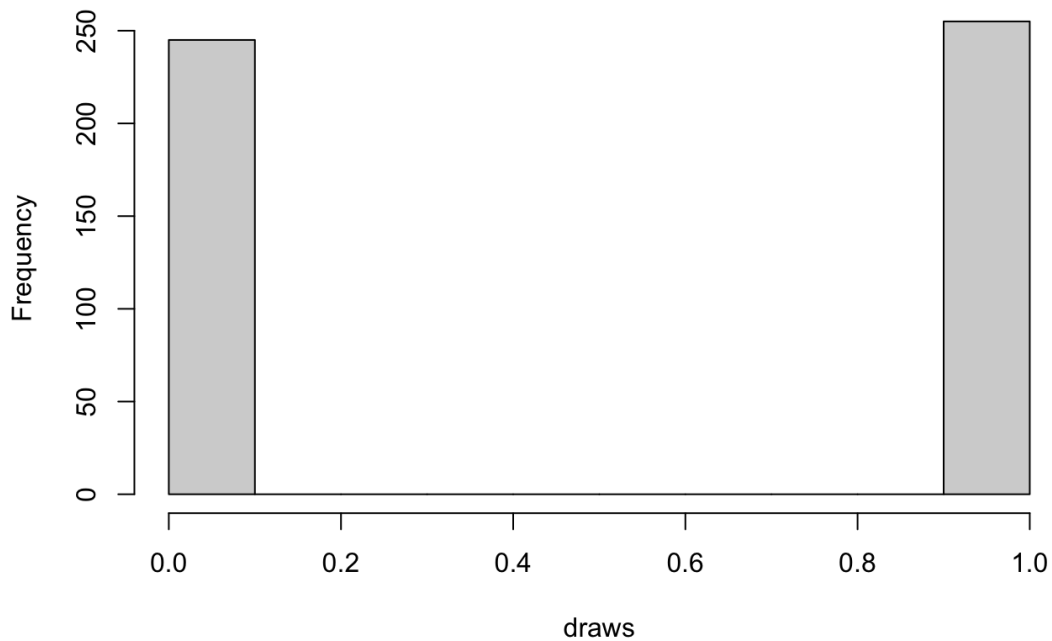
```
mean(draws)
```

```
## [1] 1.995883
```

3. Take 500 draws from Bernoulli distribution that has an expected value of 0.5. Make a histogram of these 500 draws.

```
draws<-rbinom(500, 1, .5)  
hist(draws)
```

Histogram of draws



4. Calculate the sample mean from the 500 draws from problem 3.

```
mean(draws)
```

```
## [1] 0.51
```

5. Take 500 draws from Bernoulli distribution that has a variance of 0.25.

$$\sigma^2 = p(1 - p)$$

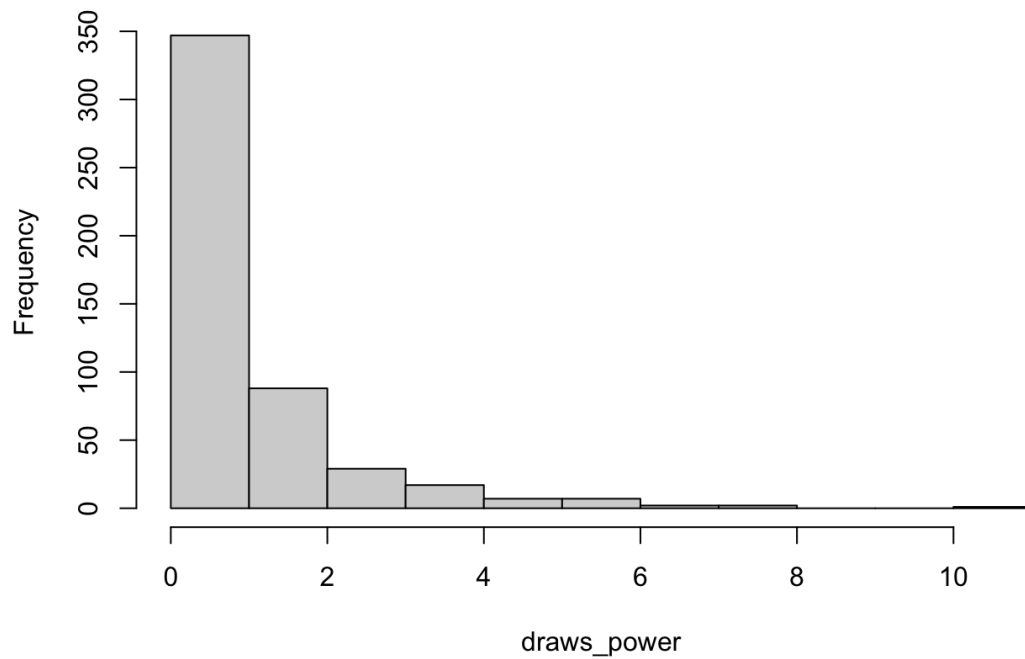
$$0.25 = p(1 - p)$$

$$p = 0.5$$

```
draws<-rbinom(500, 1,.5)
```

6. Take 500 draws from a normal distribution that has an expected value of 0 and a variance of 1. Raise these 500 draws to the second power and make a histogram.

```
draws<-rnorm(500, mean = 0, sd = sqrt(1))
draws_power <- draws^2
hist(draws_power)
```

Histogram of draws_power

7. What well-known and named probability density function is shown in the histogram you made in question 6.

Exponential distribution