HW6

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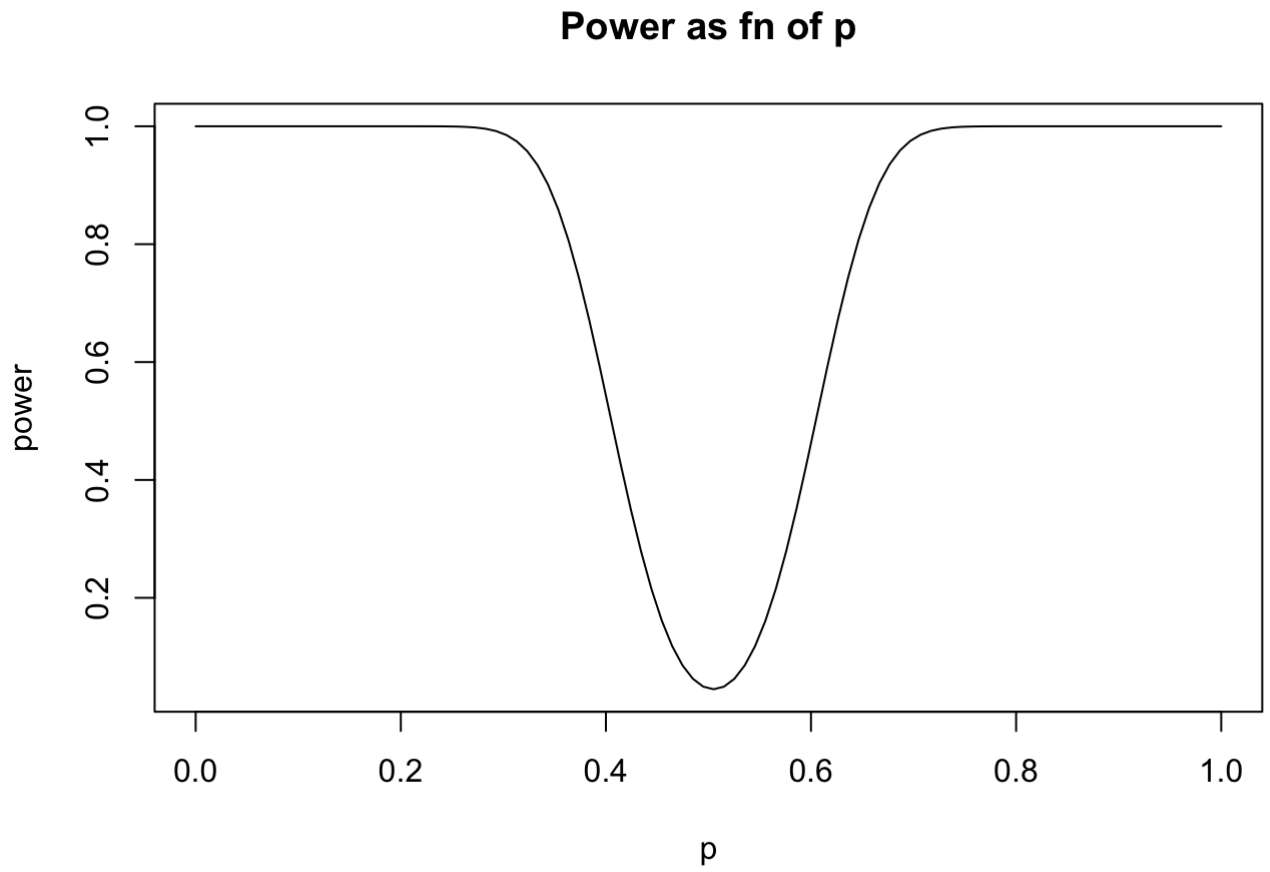
6A

```
p <- seq(0,1,length=100)
power <- pbinom(40,100,p) + (1 - pbinom(60, 100, p))
plot(p,power, type='l', main = "Power as fn of p")
```



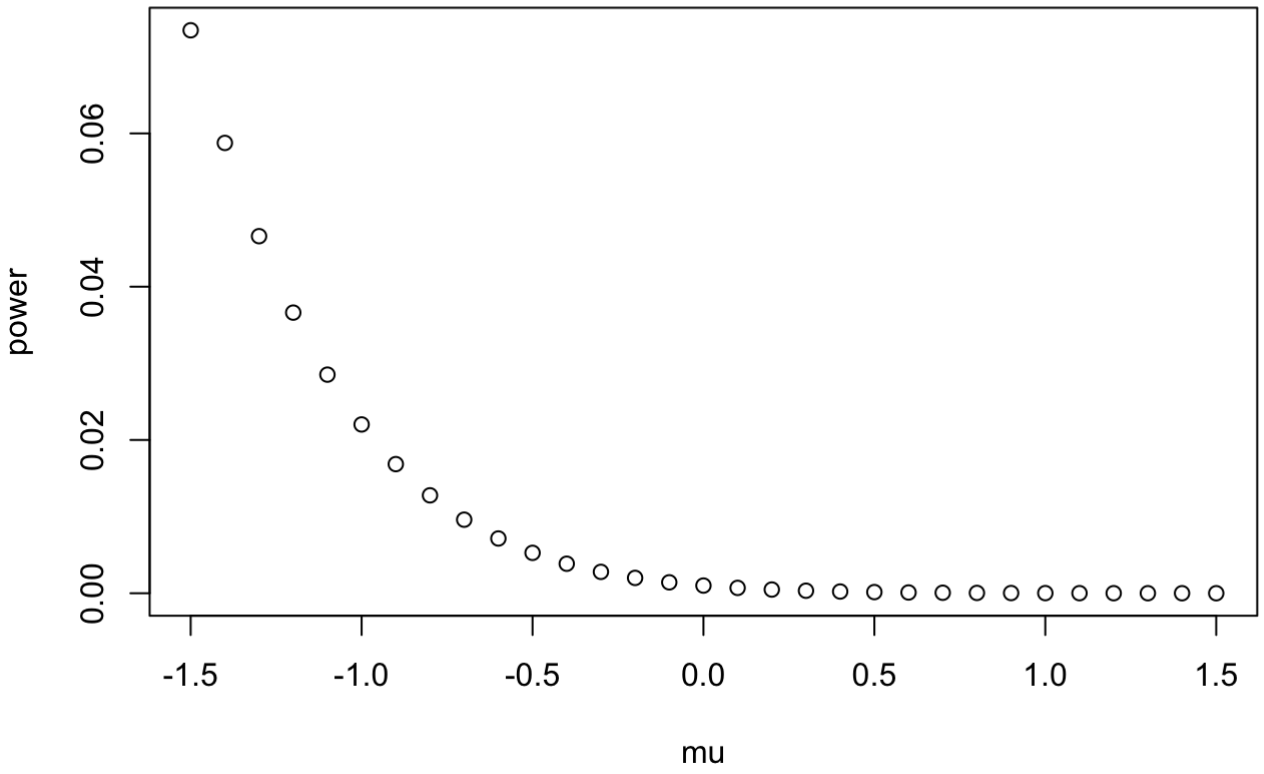

```
pbinom(40,100,.5) + (1 - pbinom(60, 100, .5))
```

```
## [1] 0.04604407
```

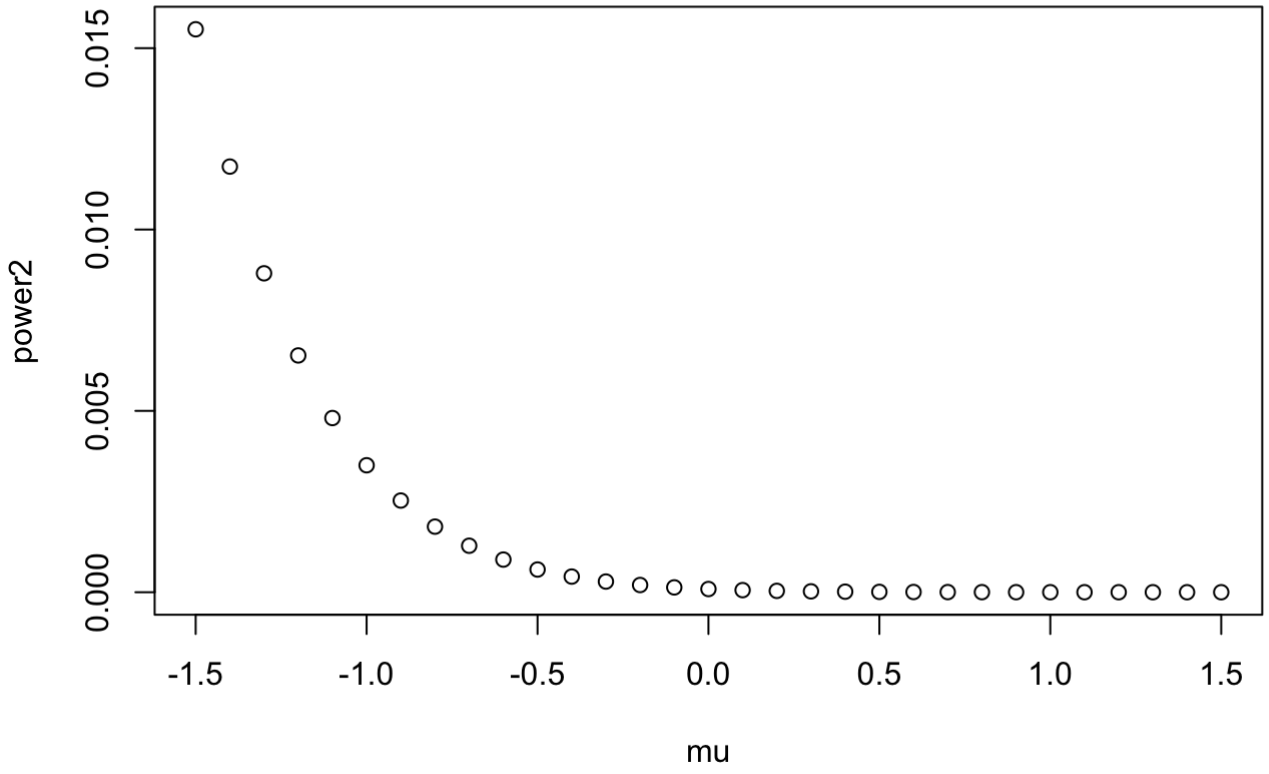
The limiting power is .046, or 4.6%, as p appproaches 0.5. The limiting power is 1, or 100%, as p approaches 0 and 1.

6B

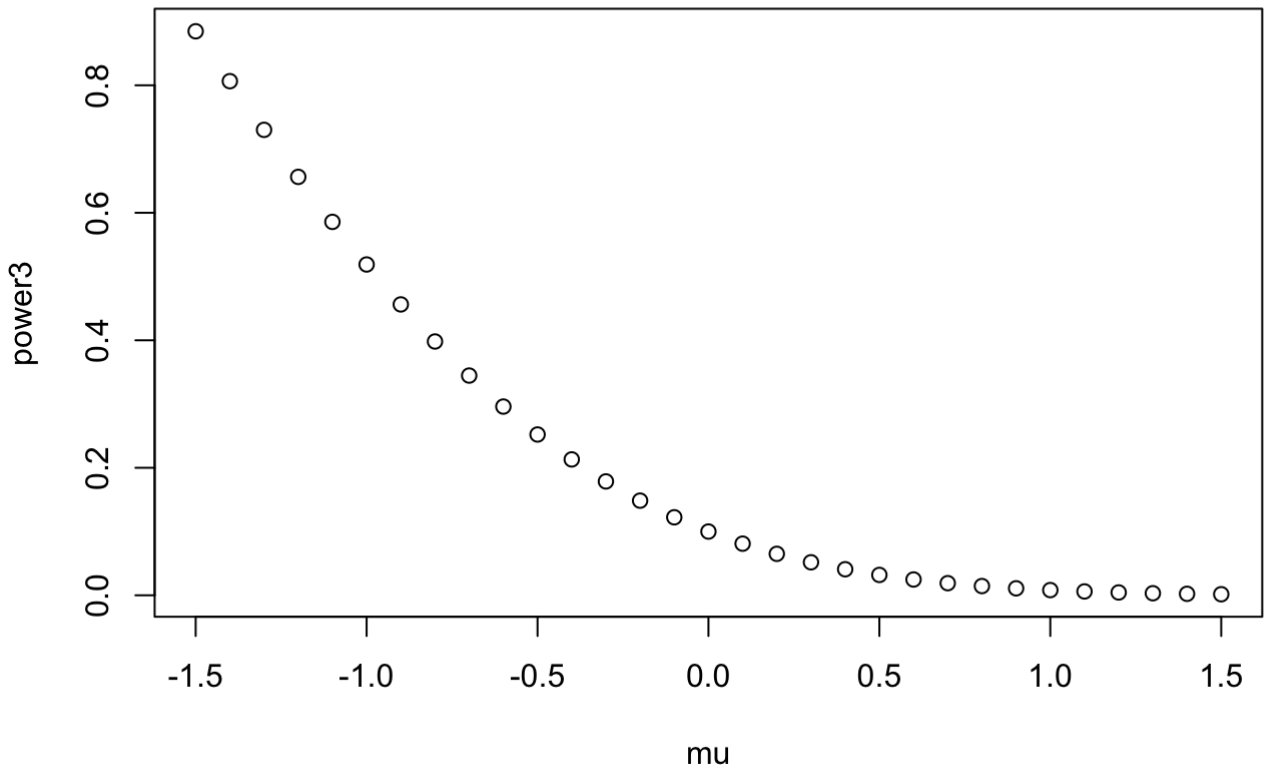
```
# Sample size 25
mu = seq(-1.5, 1.5, by = 0.1)
c = -1.645*2
power = 2 * pnorm(c, mean = mu, sd = 1)
plot(mu, power)
```



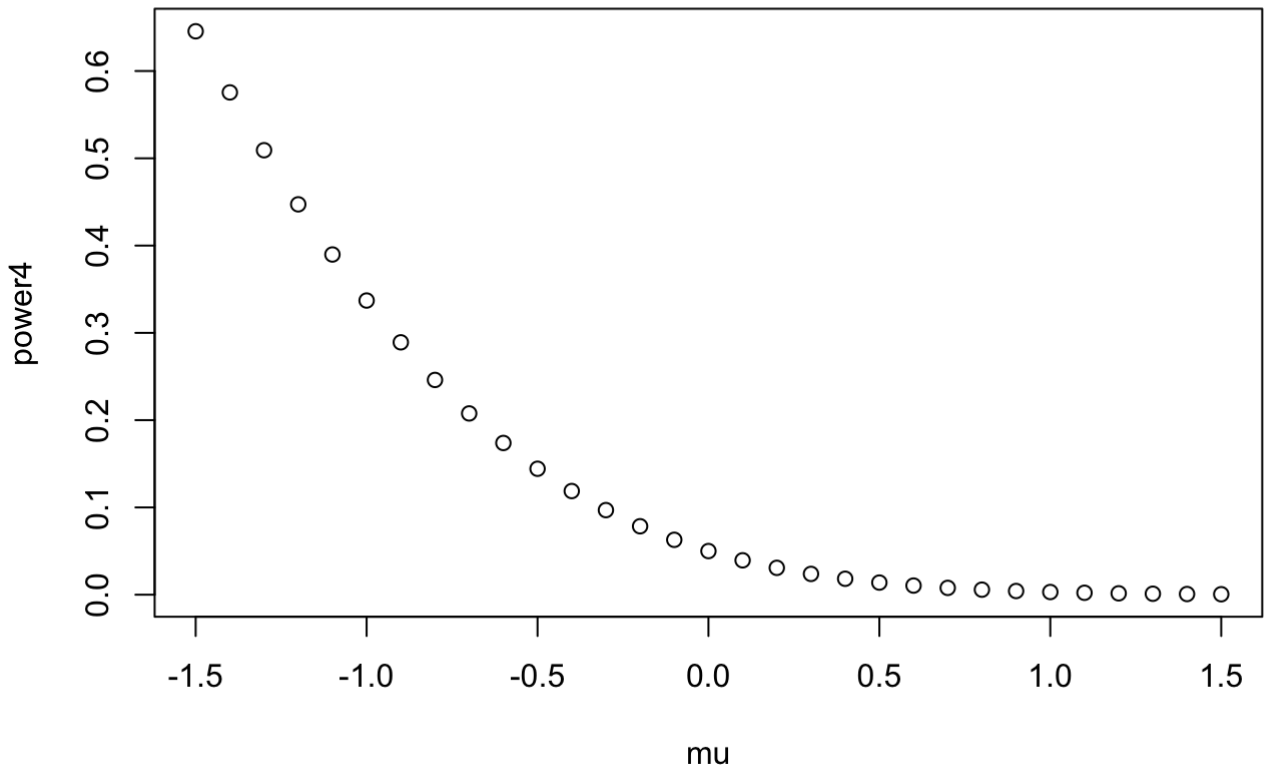

```
c2 = -1.96 * 2
power2 = 2 * pnorm(c2, mean = mu, sd = 1)
plot(mu, power2)
```




```
# Sample size 100
c3 = -1.645 * 10 / 10
power3 = 2 * pnorm(c3, mu, 1)
plot(mu, power3)
```




```
c4 = -1.96
power4 = 2 * pnorm(c4, mean = mu, sd = 1)
plot(mu, power4)
```



With a smaller alpha value the power of the test decreases, and as the mean increases the power increases as well. With a larger sample size the power is larger with smaller mu values.

6F

```
total = 0
for (i in c(0:39, 61:100)) {
  total = total + dbinom(i, 100, 0.5)
}
total
```

```
## [1] 0.0352002
```

6G

```
dl = c(103.768, 61.675, 71.210, 106.755, 92.295, 88.017, 73.154, 91.052, 100.615, 108.57
9, 123.086, 76.014, 102.754, 73.003, 84.023, 89.222, 88.062, 90.677, 82.115, 90.479)
dl_mean = mean(dl)
dl_mean
```

```
## [1] 89.82775
```

```
dl_sd = sd(dl)
dl_sd
```

```
## [1] 14.9064
```