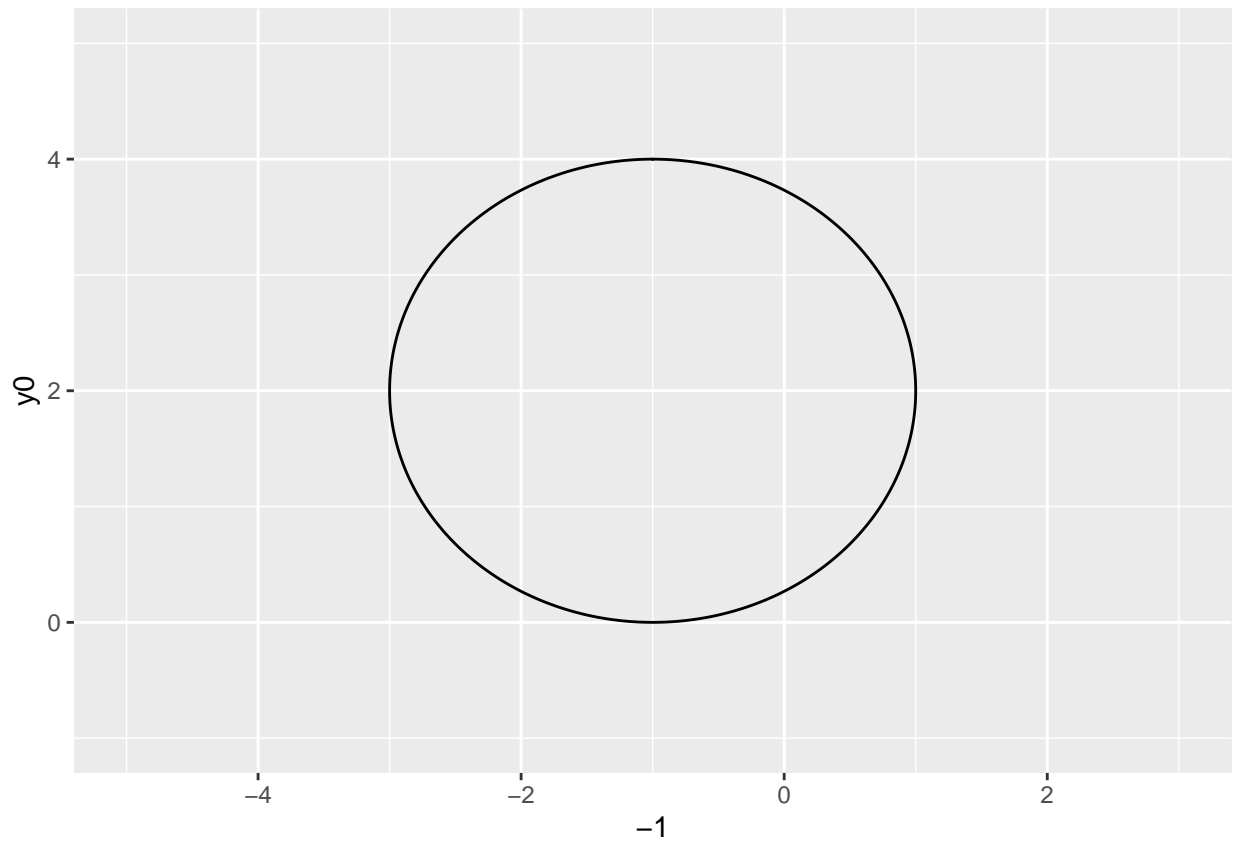# Group Discussion 9

Daniel Dulaney

10/13/2020

```r
library(tidyverse)
library(ggforce)
```

```
## Warning: package 'ggforce' was built under R version 4.0.3
```
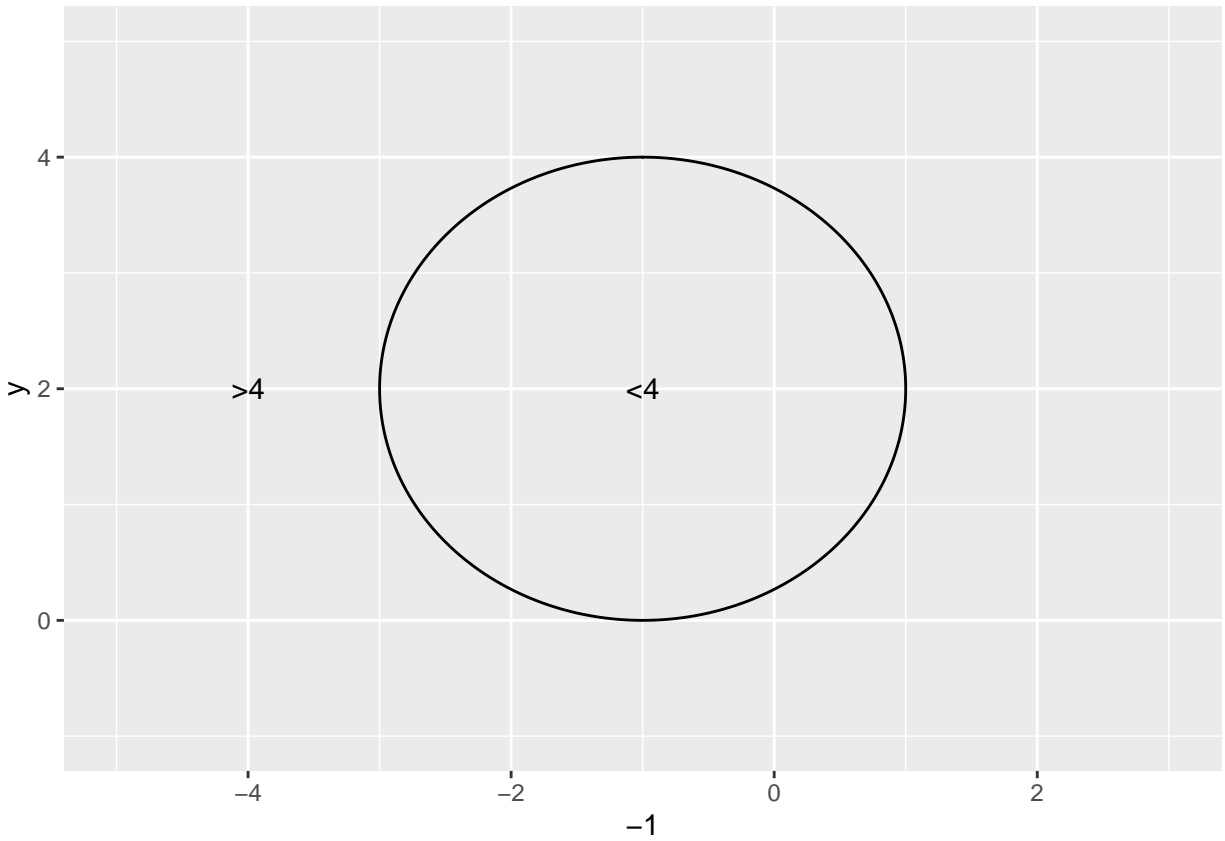
(a)

```r
circ <- ggplot() +
  geom_circle(aes(x0 = -1, y0 = 2, r = 2)) +
  xlim(-5, 3) +
  ylim(-1, 5)

circ
```

(b)

```
circ +
  geom_text(aes(x = -1, y = 2, label = "<4")) +
  geom_text(aes(x = -4, y = 2, label = ">4"))
```

(c)

We can see from the plot above that (-1, 1) would be classified red (inside the circle) while the other three points would be classified blue (outside of the circle)

(d)

By expanding the equation, we see that the boundary is simply a sum of 1st and 2nd order terms of `X1` and `X2`.