HW 1

```
library(ggplot2)
```

```
## Warning: replacing previous import 'lifecycle::last_warnings' by
## 'rlang::last_warnings' when loading 'tibble'
```

```
## Warning: replacing previous import 'lifecycle::last_warnings' by
## 'rlang::last_warnings' when loading 'pillar'
```

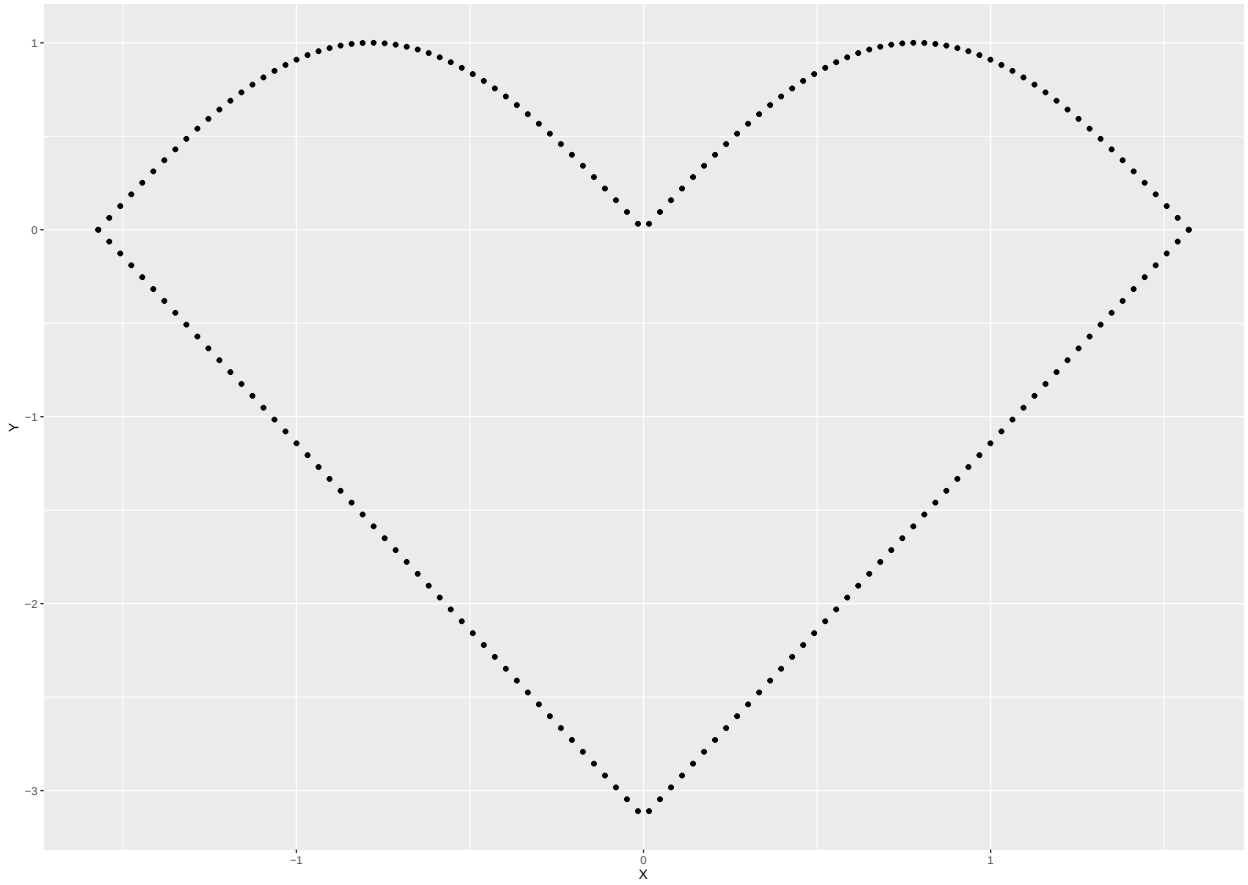
Task: find the area of a figure bounded by curves given by the equation:

$$y = 2|x| - \pi, x \in [-\frac{pi}{2}, \frac{pi}{2}]$$

$$y = |sin(2x)|, x \in [-\frac{pi}{2}, \frac{pi}{2}]$$

using the Monte Carlo method.

This is a graphical representation of the equations:



```r
trial <- 10000000
x <- runif(trial, min = -2, max = 2)
y <- runif(trial, min = -3.5, max = 1.5)
```

```r
between <- (y <= abs(sin(2*x))) & (y >= 2*abs(x) - pi)
ratio <- sum(between) / trial
total <- 4 * 5
area <- ratio * total
print ('Area of the figure is equal to:')
```

```
## [1] "Area of the figure is equal to:"
```

```r
area
```

```
## [1] 6.937072
```