

```
bisection <- function(df, lower, upper, tol) {  
  while (upper - lower > 2 * tol) {  
    m <- (lower + upper) / 2  
    df.m <- df(m)  
    while (df.m == 0) {  
      m <- (lower + upper) / 2 + runif(1, -tol, tol)  
      df.m <- df(m)  
    }  
    if (df.m < 0) {  
      lower <- m  
    } else {  
      upper <- m  
    }  
  }  
  return((upper + lower) / 2)  
}
```