Name: _____

Consider the following data (from NOAA) on wind temperature as a function of the day of the year at noon on a buoy off the coast of Santa Monica.

1 Step Functions

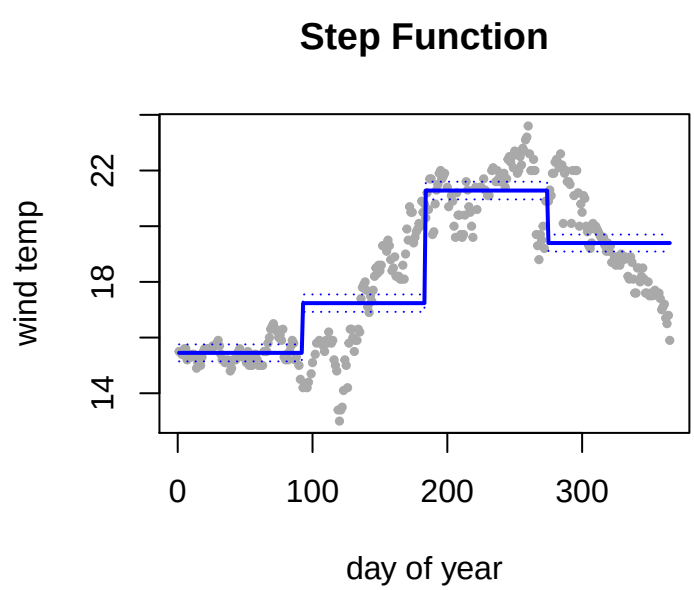
Directly on the plot below, draw the estimated linear model.

```
table(cut(buoy_data2$yearday, 4))

##
## (0.636,92]   (92,183]  (183,274]  (274,365]
##         90         86         83         90

wind.step <- lm(WTMP ~ cut(yearday, 4), data=buoy_data2)
summary(wind.step)$coef

##                           Estimate Std. Error t value  Pr(>|t|)
## (Intercept)                  15.45      0.153  101.22 1.29e-258
## cut(yearday, 4)(92,183]       1.79      0.218    8.18  5.32e-15
## cut(yearday, 4)(183,274]      5.83      0.220   26.46  4.86e-85
## cut(yearday, 4)(274,365]      3.95      0.216   18.28  1.12e-52
```



2 Cubic Function

Directly on the plot below, sketch the estimated linear model (hint: connect a few fitted points).

```
wind.cub <- lm(WTMP ~ poly(yearday,3, raw=TRUE), data=buoy_data2)
summary(wind.cub)$coef

##                                Estimate Std. Error t value  Pr(>|t|)
## (Intercept)                    1.62e+01   1.96e-01    82.3 6.55e-229
## poly(yearday, 3, raw = TRUE)1 -5.44e-02   4.70e-03   -11.6  2.16e-26
## poly(yearday, 3, raw = TRUE)2  6.55e-04   2.99e-05    21.9  3.17e-67
## poly(yearday, 3, raw = TRUE)3 -1.40e-06   5.39e-08   -26.0  2.14e-83
```