HCH8

4,11,20,26

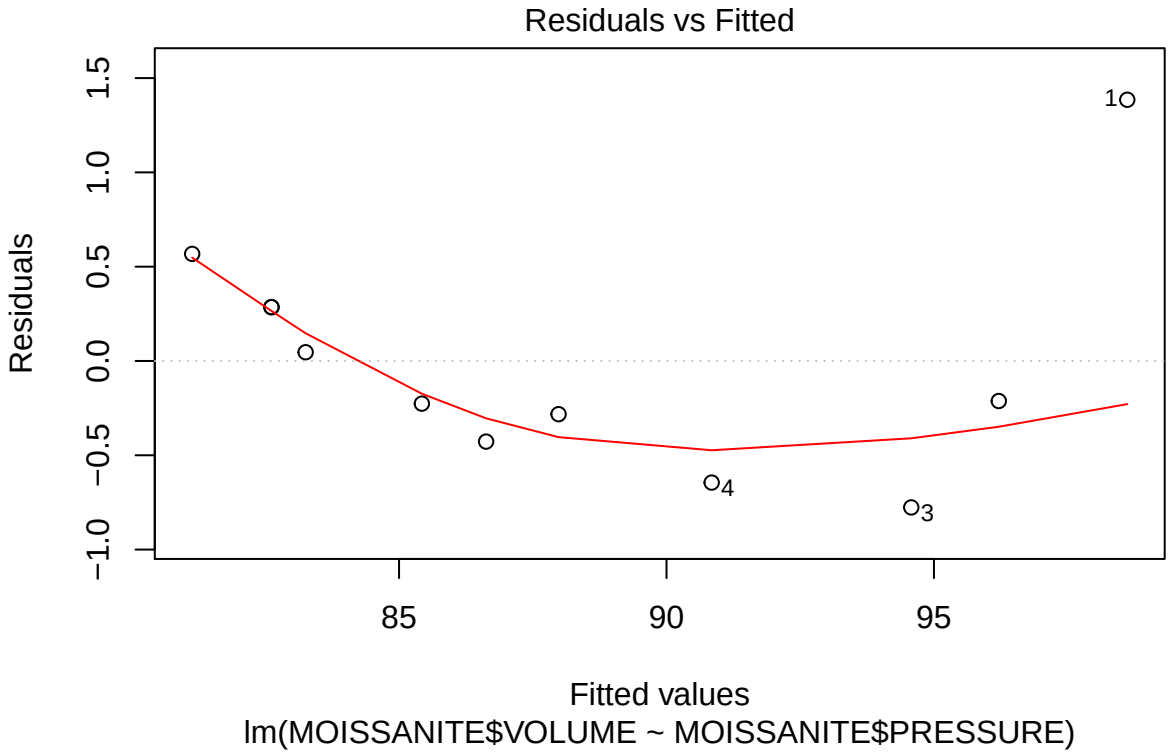
Question 4 U dataset: MOISSANITE

(a) Calculate the regression residuals.
(b) Plot the residuals against x. Do you detect a trend?
(c) Propose an alternative model based on the plot, part b.
(d) Fit and analyze the model you proposed in part c.

```
setwd("~/Documents/SFSU.FALL.2017/424/R/R/Exercises&Examples")
load("MOISSANITE.Rdata")
View(MOISSANITE)
```

a) calculate residuals

```
model = lm(MOISSANITE$VOLUME~MOISSANITE$PRESSURE)
plot(model, which = 1:1)
```




```
residuals(model)
```

```
##           1           2           3           4           5           6
##  1.38508113 -0.21233184 -0.77652790 -0.64485018 -0.28219329 -0.42754316
##           7           8           9          10          11
## -0.22624964  0.04630246  0.28528837  0.28528837  0.56773568
```

```
sum(residuals(model))
```

```
## [1] -1.554312e-15
```

After plotting the residuals of the model, the plot of FItted values vs Residuals, we can see that there is a

trend in the residuals and instead of being linear, appears to be quadratic.

The new proposed model is $E(y) = \hat{\beta}_0 + \hat{\beta}_1 x_1 + \hat{\beta}_2 x_1^2$ Testing this:

```
model2 = lm(MOISSANITE$VOLUME~MOISSANITE$PRESSURE+I(MOISSANITE$PRESSURE^2))
plot(model2,which = 1:1)
```