HWK3

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question 1.

```
sample1 <- rnorm(10,0,1)
sample1
```

```
##  [1] -1.2591864  0.6174185  0.8214974  0.5903229  0.2399127 -0.6975131
##  [7]  0.5940571  0.1356971 -1.5602417 -1.4896401
```

```
mean(sample1)
```

```
## [1] -0.2007676
```

```
sd(sample1)
```

```
## [1] 0.9519454
```

```
sample2 <- rnorm(10,100,1)
sample2
```

```
##  [1]  99.83935 100.27636  99.33311 100.92943  99.54241  99.56391  99.57379
##  [8]  99.40431 100.92701 100.18182
```

```
mean(sample2)
```

```
## [1] 99.95715
```

```
sd(sample2)
```

```
## [1] 0.5982254
```

```
sample3 <- rnorm(10,1000,10)
sample3
```

```
##  [1] 1005.8991  998.0689  998.1597  996.7504  994.4341 1010.5421  987.0127
##  [8]  990.7123 1013.7642 1014.2990
```

```
sd(sample3)
```

```
## [1] 9.627158
```

```
mean(sample3)
```

```
## [1] 1000.964
```

Question 2

```r
coin <- c("Head","Tail")


sample(coin,size = 20, replace=TRUE)
```

```
##  [1] "Tail" "Tail" "Tail" "Tail" "Head" "Head" "Tail" "Head" "Head" "Tail"
## [11] "Tail" "Head" "Tail" "Head" "Head" "Tail" "Head" "Tail" "Head" "Tail"
```

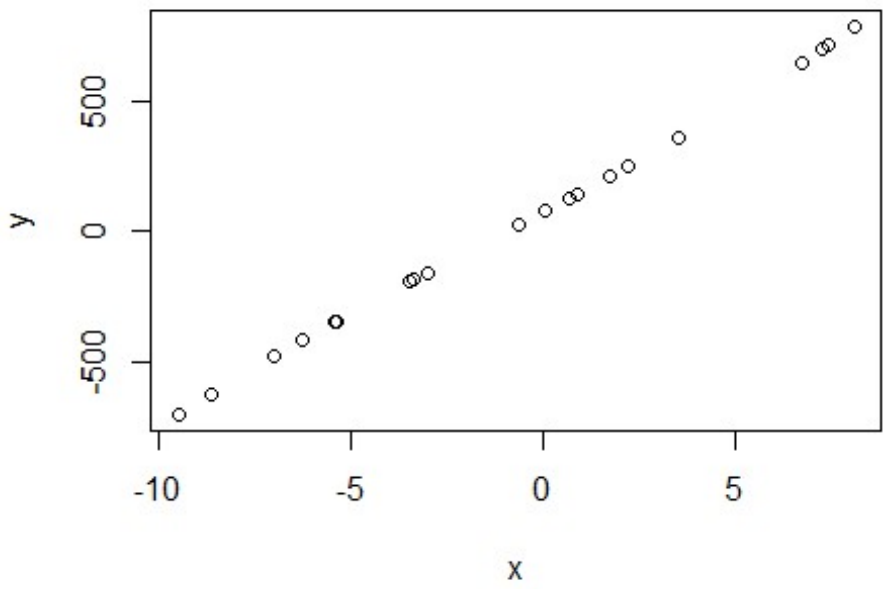
question 3

```r
set.seed(158)
coin <- c("Head","Tail")


sample(coin,size = 20, replace=TRUE)
```

```
##  [1] "Tail" "Tail" "Tail" "Head" "Head" "Head" "Head" "Tail" "Tail" "Tail"
## [11] "Head" "Tail" "Tail" "Tail" "Head" "Head" "Head" "Head" "Head" "Tail"
```

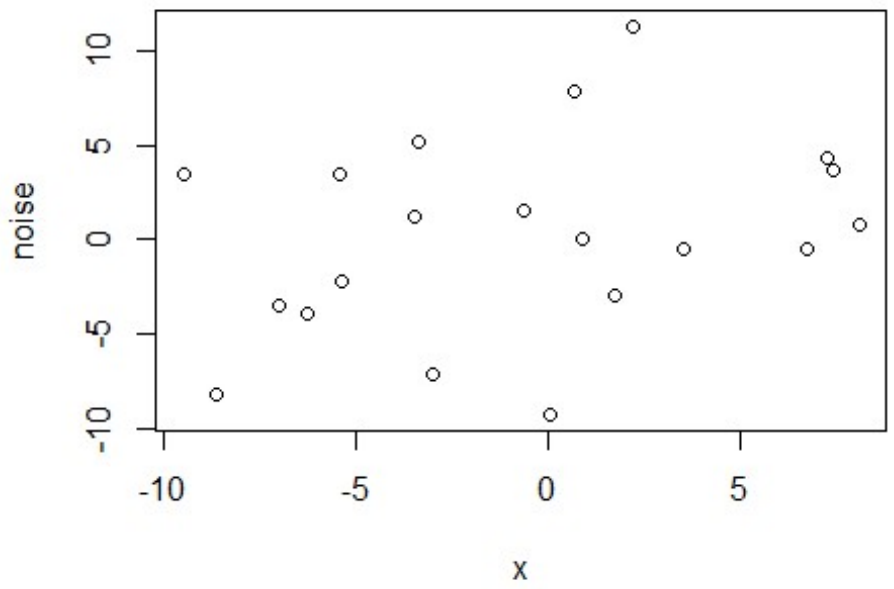
question 4 a/b/c

```r
x <- runif(20,min = -10, max = 10)

b0 = 75
b1 = 2
b2 = 0.5
b3 = 0.1

y=b0 +(b0*x)+(b1*x)+(b2*x*x)+(b3*x*x*x)

plot(x,y)
```



question 4 d

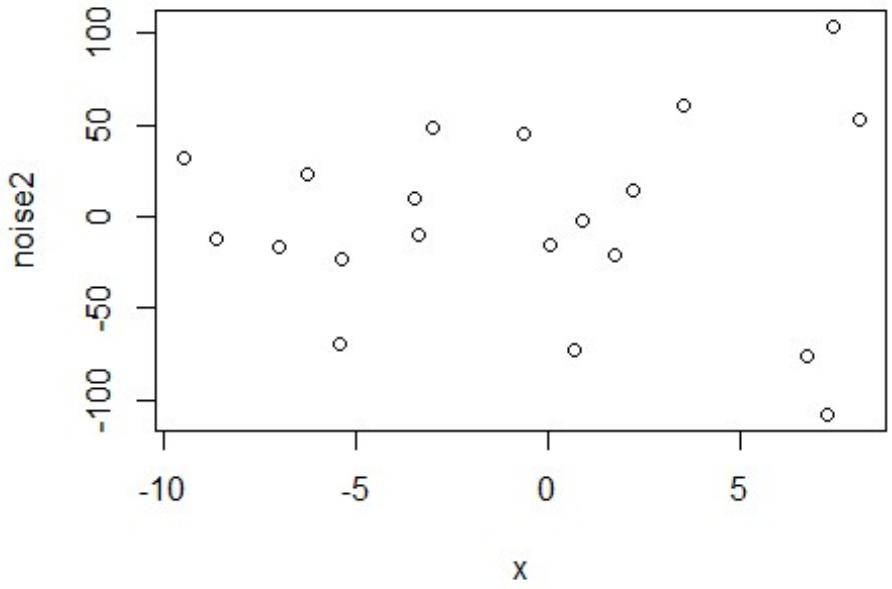
```
noise <- rnorm(20,0,5)
plot (x,noise)
```



I looks random, and without any correlation between the points.

Question 4 e

```
noise2 <- rnorm(20,0,50)
plot (x,noise2)
```



It has a lot more space between the points.

question 4 f

```
compare <- cbind(y,noise,noise2)
compare
```

```
##                y       noise      noise2
##  [1,]  211.35246 -2.96011023  -20.911398
##  [2,]   79.44783 -9.28444240  -15.146239
##  [3,] -343.47809  3.45398541  -68.946506
##  [4,]  144.23596  0.05072011   -1.748088
##  [5,] -698.66616  3.53530657   31.682086
##  [6,]  783.09960  0.85278845   52.533455
##  [7,]  712.88345  3.65565089  103.785035
##  [8,]  248.33262 11.34069783   14.599314
##  [9,] -157.23576 -7.12835856   48.946299
## [10,]  125.14277  7.94374182  -72.127491
## [11,]   23.37933  1.60055217   45.259268
## [12,] -181.85969  5.18336508   -9.439571
## [13,] -192.83471  1.18870848    9.486811
## [14,]  698.36687  4.31340726 -107.735190
## [15,] -477.66595 -3.50544027  -16.685265
## [16,]  647.03992 -0.53369841  -76.230805
## [17,] -412.70205 -3.92198531   23.402754
## [18,]  356.98836 -0.52666287   60.370180
## [19,] -342.41325 -2.21178533  -23.245546
## [20,] -620.18107 -8.21730153  -11.639469
```

they have no linear relation and are a lot smaller in comparison to the y vaulues.