HW1

Hongxu Ma

2022-10-04

Question 4

```
polyroot(c(1,-2))
```

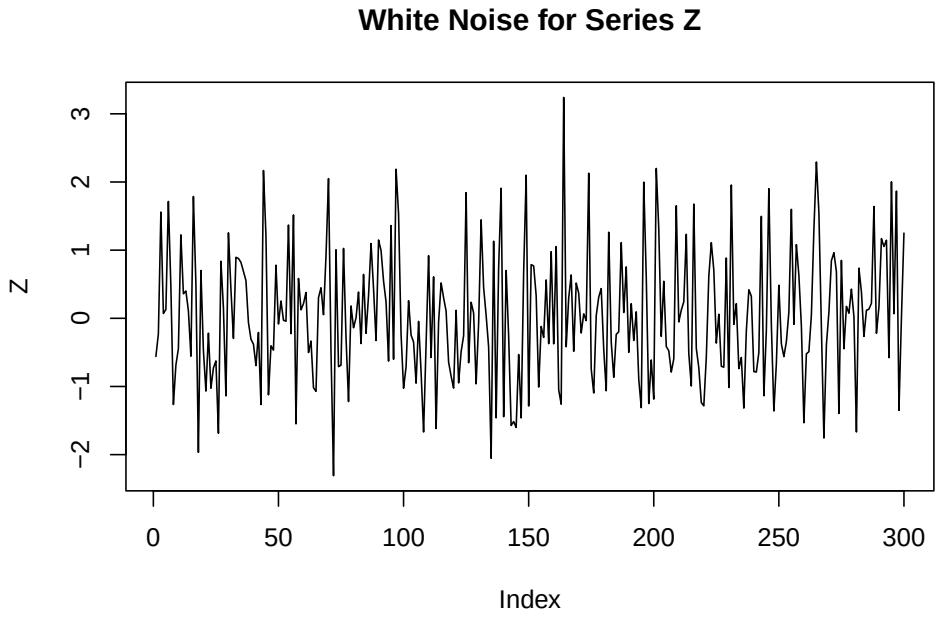
```
## [1] 0.5+0i
```

```
polyroot(c(1,-0.45,-0.05))
```

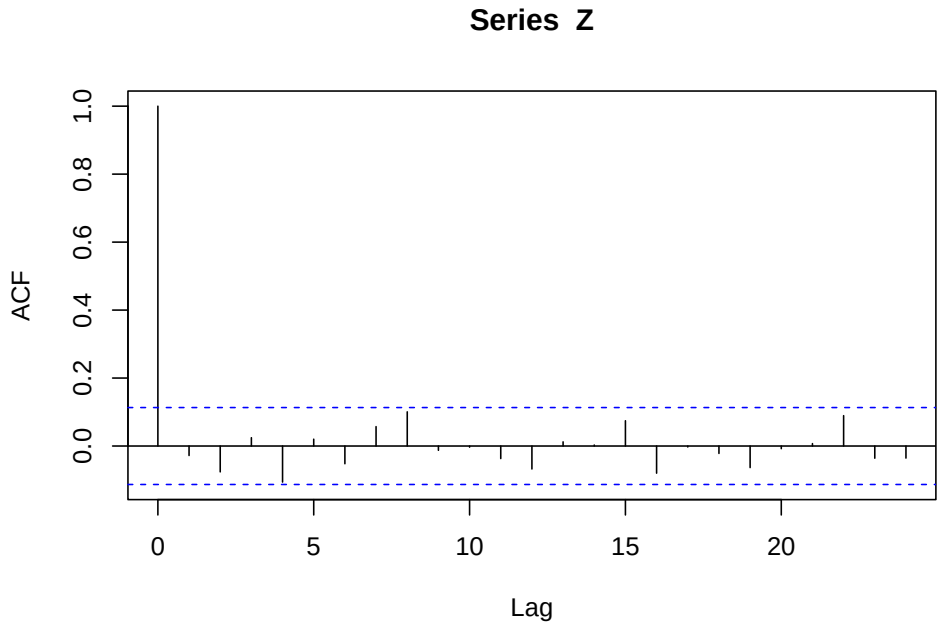
```
## [1]   1.844289+0i -10.844289-0i
```

Question 6

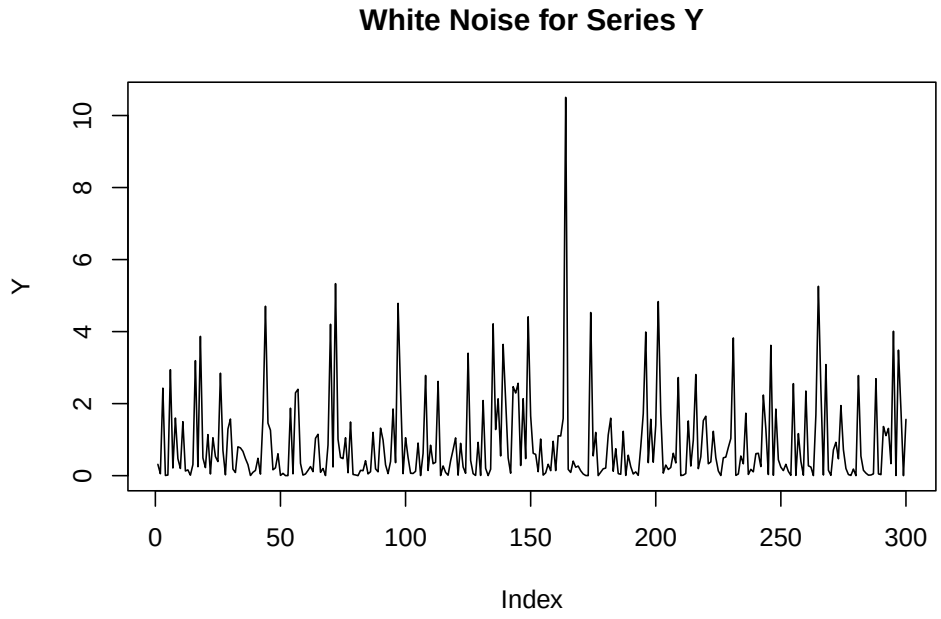
```
set.seed(123)
Z = rnorm(300)
plot(Z, type = 'l', main = "White Noise for Series Z")
```



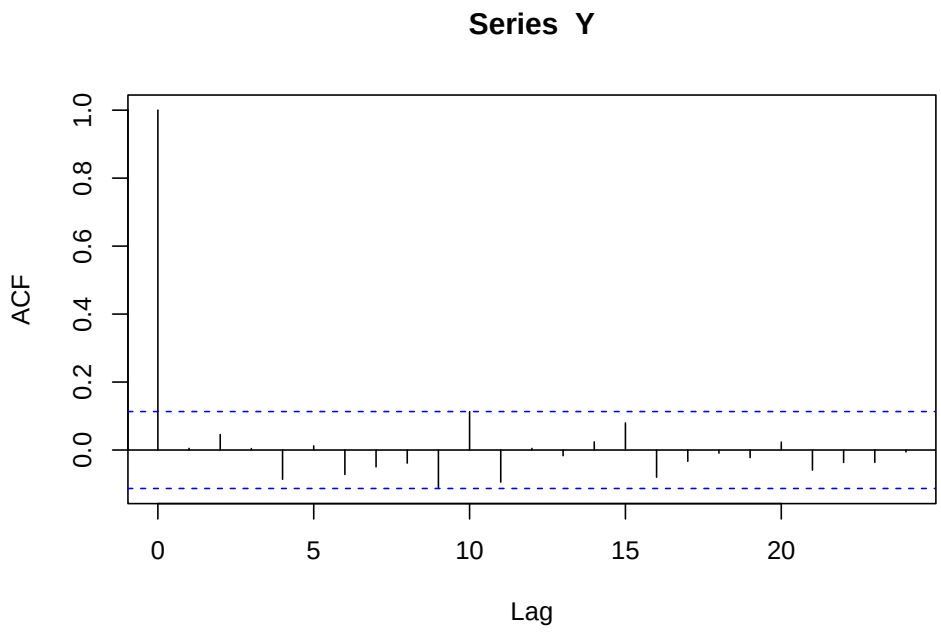
```
acf(Z)
```




```
set.seed(123)
Z = rnorm(300)
Y = Z^2
plot(Y, type = 'l', main = "White Noise for Series Y")
```



```
acf(Y)
```




```
Box.test(Y, type="Ljung-Box")
```

```
##
##  Box-Ljung test
##
## data:  Y
## X-squared = 0.0069343, df = 1, p-value = 0.9336
```

Since graphs shows no obvious trend as function of timeline and they have constant mean, series z and y are both stationary.

There is no noticeable difference between them. Since we have Y = Ztˆ2, mean of Y cannot be zero.

No, Y is white noise sequence, because lag values are under the boundary and only auto-correlation = 1 when lag is 0.