Tarea Preliminnares

Diego Delgado Palomares

28/1/2021

Pregunta 2

Realiza las siguientes sumas a mano y comprueba tu respuesta en R, Python u Octave:

```
(2+3i)+(1+1i)
```

```
## [1] 3+4i
```

```
(1+1i)+(1-1i)
```

```
## [1] 2+0i
```

```
###  x^2 + x + 1) + (x - 1)
polynomial(coef = c(1,1,1))+polynomial(coef = c(-1,1))
```

```
## 2*x + x^2
```

Pregunta 3

Realiza los siguientes productos a mano y comprueba tu respuesta en R, Python u Octave:

```
(2 + 3i)*(1 + 1i)
```

```
## [1] -1+5i
```

```
(1 + 1i)*(1 - 1i)
```

```
## [1] 2+0i
```

```
### (x^2 + x + 1)  (x - 1)
polynomial(coef = c(1,1,1))*polynomial(coef = c(-1,1))
```

```
## -1 + x^3
```

```
### (x + 1)^2
polynomial(coef = c(1,1))**2
```

```
## 1 + 2*x + x^2
```

```
### (x + 1) · (x - 1)
polynomial(coef = c(1,1))*polynomial(coef = c(-1,1))
```

```
## -1 + x^2
```

Pregunta 4

Calcula el módulo de los siguientes números complejos (realizando primero las operaciones pertinentes):

```
Mod(2 + 3i)
```

```
## [1] 3.605551
```

```
Mod(1i)
```

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

```
p4_c <- 2 + 3i +1 + 1i
Mod(p4_c)
```

```
## [1] 5
```

```
p4_d<- 1 + 1i+1 - 1i
Mod(p4_d)
```

```
## [1] 2
```

```
p4_e <- (2 + 3i)*(1 + 1i)
Mod(p4_e)
```

```
## [1] 5.09902
```

```
p4_f<-(1 + 1i)*(1 - 1i)
Mod(p4_f)
```

```
## [1] 2
```

Pregunta 5

Indica el grado de los siguientes polinomios (realizando primero las operaciones pertinentes):

```
### 2x + 2
length(polynomial(coef = c(2,2)))-1
```

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

```
### x^5+ 3x + 2
length(polynomial(coef = c(2,3,0,0,0,1)))-1
```

```
## [1] 5
```

```
### (x^2 + x + 1)(x - 1)
polynomial(coef = c(1,1,1))*polynomial(coef = c(-1,1))
```

```
## -1 + x^3
```

```
length(polynomial(coef = c(1,1,1))*polynomial(coef = c(-1,1)))-1
```

```
## [1] 3
```

```
###  (x + 1)^2
polynomial(coef = c(1,1))*polynomial(coef = c(1,1))
```

```
## 1 + 2*x + x^2
```

```
length(polynomial(coef = c(1,1))*polynomial(coef = c(1,1)))-1
```

```
## [1] 2
```

```
### (x + 1) · (x - 1)
polynomial(coef = c(1,1))*polynomial(coef = c(-1,1))
```

```
## -1 + x^2
```

```r
length(polynomial(coef = c(1,1))*polynomial(coef = c(-1,1)))-1
```

```
## [1] 2
```

Pregunta 6

¿Son iguales los siguientes polinomios?

```r
### (x + 1)^2 y x^2 + 1
polynomial(coef = c(1,1))**2==polynomial(coef = c(1,0,1))
```

```
## [1] FALSE
```

```r
### (x + 1)^2 y x^2 + 2x + 1
polynomial(coef = c(1,1))**2==polynomial(coef = c(1,2,1))
```

```
## [1] TRUE
```

```r
### (x + 1)^3 y x^3 + 1
polynomial(coef = c(1,1))**3==polynomial(coef = c(1,0,0,1))
```

```
## [1] FALSE
```

```r
### (x + 1)^3 y x^3 + 3x^2 + 3x + 1
polynomial(coef = c(1,1))**3==polynomial(coef = c(1,3,3,1))
```

```
## [1] TRUE
```

```r
### (x + 1)(x - 1) y x^2 - 1
polynomial(coef = c(1,1))*polynomial(coef = c(-1,1))==polynomial(coef = c(-1,0,1))
```

```
## [1] TRUE
```

```r
### (x - 1)^2 y x^2 - 2x + 1
polynomial(coef = c(-1,1))**2==polynomial(coef = c(1,-2,1))
```

```
## [1] TRUE
```

Pregunta 7

Encuentra las raíces de los siguientes polinomios:

```r
### 2x + 2
polyroot(polynomial(coef = c(2,2)))
```

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

```r
### x^5 + 3x + 2
polyroot(polynomial(coef = c(1,3,0,0,0,1)))
```

```
## [1] -0.3319890+0.0000000i -0.8390724+0.9438516i -0.8390724-0.9438516i
## [4]  1.0050669-0.9372592i  1.0050669+0.9372592i
```

```r
### (x^2 + x + 1)(x - 1)
polyroot(polynomial(coef = c(1,1,1))*polynomial(coef = c(1,1)))
```

```
## [1] -0.5+0.8660254i -1.0+0.0000000i -0.5-0.8660254i
```

```r
### (x + 1)^2
polyroot(polynomial(coef = c(1,1))**2)
```

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

```r
### (x + 1)(x - 1)
polyroot(polynomial(coef = c(1,1))*polynomial(coef = c(-1,1)))
```

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