Preliminares

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En R

Pregunta 2

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

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

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

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

```
library(polynom)
polynomial(coef = c(1,1,1)) + polynomial(coef = c(-1,1))
```

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

Pregunta 3

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

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

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

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

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

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

```r
polynomial(coef = c(1,1))^2
```

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

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

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

Pregunta 4

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

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

```r
Mod(1i)
```

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

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

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

```r
Mod((1+1i)+(1-1i))
```

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

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

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

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

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

Pregunta 5

```r
p51 = polynomial(coef = c(2,2))
length(p51) - 1
```

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

```r
p52 = polynomial(coef = c(2,3,0,0,0,1))
length(p52) - 1
```

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

```r
p53 = polynomial(coef = c(1,1,1))*polynomial(coef = c(-1,1))
length(p53) - 1
```

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

```r
p54 = polynomial(coef = c(1,1))^2
length(p54) - 1
```

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

```r
p55 = polynomial(coef = c(1,1))*polynomial(coef = c(-1,1))
length(p55) - 1
```

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

Pregunta 6

```r
p611 = polynomial(coef = c(1,1))^2
p612 = polynomial(coef = c(1,0,1))
p611 == p612
```

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

```r
p621 = polynomial(coef = c(1,1))^2
p622 = polynomial(coef = c(1,2,1))
p621 == p622
```

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

```r
p631 = polynomial(coef = c(1,1))^3
p632 = polynomial(coef = c(1,0,0,1))
p631 == p632
```

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

```r
p641 = polynomial(coef = c(1,1))^3
p642 = polynomial(coef = c(1,3,3,1))
p641 == p642
```

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

```r
p651 = polynomial(coef = c(1,1)) * polynomial(coef = c(-1,1))
p652 = polynomial(coef = c(-1,0,1))
p651 == p652
```

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

```r
p661 = polynomial(coef = c(-1,1))^2
p662 = polynomial(coef = c(1,-2,1))
p661 == p662
```

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

Pregunta 7

```r
polyroot(c(2,2))
```

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

```r
polyroot(c(2,3,0,0,0,1))
```

```
## [1] -0.6328345+0.000000i -0.7484685+0.995434i -0.7484685-0.995434i
## [4]  1.0648858-0.950546i  1.0648858+0.950546i
```

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

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

```r
polyroot(polynomial(coef = c(1,1,1))^2)
```

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

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

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

En Python

En Matlab