Resolução da Folha de Números Complexos

1

(a)

```
Solve[(2 + x I) (3 - 2 I) == 12 + 5 I]
```

$$\{\{x \to 3\}\}$$

(b)

```
Solve[(2 + x I)^2 == 4]
```

$$\{\{x \to 0\}, \{x \to 4\,i\}\}$$

2

(a)

```
Simplify[(3 - 2 I) (1 + I) + Abs[3 + 4 I]]
```

$$10 + i$$

(b)

```
Simplify[(3 - 2 I)/(1 - I) - (3 - 7 I)/(2 - 3 I)]
```

$$\frac{11}{26} + \frac{23\,i}{26}$$

3

(a)

```
Solve[z^2 == 3 - 4 I, z]
```

$$\{\{z \to -2 + i\}, \{z \to 2 - i\}\}$$

(b)

```
Solve[z (2 - I) == (Conjugate[z] + 1) (1 + I), z]
```

$$\{\{z \to 1 + i\}\}$$

4

(a)

```
Abs[3 - 3 I]
```

$$3\sqrt{2}$$

```
Arg[3 - 3 I]
```

$$-\frac{\pi}{4}$$

(b)

```
Abs[-6 I]
```

6

```
Arg[-6 I]
```

$-\frac{\pi}{2}$

(c)

```
Abs[Sqrt[3] + I]
```

2

```
Arg[Sqrt[3] + I]
```

$\frac{\pi}{6}$

5

(a)

```
ExpToTrig[Exp[7 Pi I / 3]]
```

$\frac{1}{2} + \frac{i\sqrt{3}}{2}$

(b)

```
ExpToTrig[Sqrt[2] Exp[-Pi I / 4]]
```

$1 - i$

(c)

```
ExpToTrig[2 Sqrt[3] Exp[-2 Pi I / 6]]
```

$-3i + \sqrt{3}$

6

(a)

```
Solve[x^2 - x + (1 - I) == 0, x]
```

{{x → -i}, {x → 1 + i}}

(b)

```
Solve[x^2 - 3 (1 - I) x - 5 I == 0, x]
```

{{x → 1 - 2 i}, {x → 2 - i}}

(c)

```
Solve[x^2 - 2 x + 2 == 0, x]
```

{{x → 1 - i}, {x → 1 + i}}

(d)

```
Solve[x^2 + 9 == 0, x]
```

{{x → -3 i}, {x → 3 i}}

(e)

```
Solve[x^2 - 4 x + 5 == 0, x]
```

```
{{x → 2 - i}, {x → 2 + i}}
```

7

(a)

```
(2 + 2 I)^4
```

```
-64
```

(b)

```
(1 - I)^3
```

```
-2 - 2 i
```