

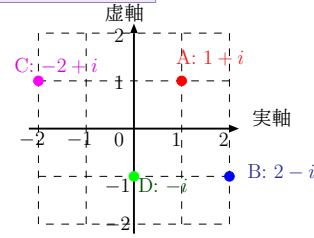
# 電 210 電気数学 IV

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(専門: 制御工学)

## 演習 1-1 解答

$$\begin{aligned}\alpha = 2 + 3i, & \quad \operatorname{Re} \alpha = \boxed{2}, \quad \operatorname{Im} \alpha = \boxed{3} \\ \alpha = -2 + 5i, & \quad \operatorname{Re} \alpha = \boxed{-2}, \quad \operatorname{Im} \alpha = \boxed{5} \\ \alpha = -6, & \quad \operatorname{Re} \alpha = \boxed{-6}, \quad \operatorname{Im} \alpha = \boxed{0} \\ \alpha = 7i, & \quad \operatorname{Re} \alpha = \boxed{0}, \quad \operatorname{Im} \alpha = \boxed{7}\end{aligned}$$

## 演習 1-2 解答



## 演習 1-3 解答 (1)

- $(1+i) + (-2-2i) = \boxed{-1} + \boxed{-1}i$  ( $= -1-i$ )  
(穴埋めの都合で  $-1 + -1i$  という変な書き方になっているが穴埋めでなければ  $-1-i$  と書くのが正しい, 以下も同様)
- $(1+i) - (-2-2i) = \boxed{3} + \boxed{3}i$

## 演習 1-3 解答 (2)

- $(1+i)(1+2i) = \boxed{-1} + \boxed{3}i$
- $\frac{1}{1+2i} = \frac{\boxed{1}}{\boxed{5}} + \frac{\boxed{-2}}{\boxed{5}}i$  ( $= \frac{1}{5} - \frac{2}{5}i$ ) だから  
 $\frac{1+i}{1+2i} = (1+i)\left(\frac{\boxed{1}}{\boxed{5}} + \frac{\boxed{-2}}{\boxed{5}}i\right) = \frac{\boxed{3}}{\boxed{5}} + \frac{\boxed{-1}}{\boxed{5}}i$   
( $= \frac{3}{5} - \frac{1}{5}i$ )

## 演習 1-4 解答 (1)

- $(1+2i) + (-2+i) = \boxed{-1} + \boxed{3}i$
- $(-2+i) + (1+2i) = \boxed{-1} + \boxed{3}i$
- $((-2+i) + (2-i)) + (1-i) = (\boxed{0} + \boxed{0}i) + (1-i) = \boxed{1} + \boxed{-1}i$  ( $= 1-i$ )
- $(-2+i) + ((2-i) + (1-i)) = (-2+i) + (\boxed{3} + \boxed{-2}i) = \boxed{1} + \boxed{-1}i$  ( $= 1-i$ )

## 演習 1-4 解答 (2)

- $\alpha = 2 - 4i$  のとき  $-\alpha = \boxed{-2} + \boxed{4}i$ ,  
 $\alpha + (-\alpha) = \boxed{0} + \boxed{0}i$  ( $= 0$ )
- $(-1 - 4i) + 0 = \boxed{-1} + \boxed{-4}i$  ( $= -1 - 4i$ )

## 演習 1-5 解答

- $(1+i)(1+2i) = \boxed{-1} + \boxed{3}i$
- $(1+2i)(1+i) = \boxed{-1} + \boxed{3}i$
- $((1+i)(1-i))(2+i) = (\boxed{2} + \boxed{0}i)(2+i) = \boxed{4} + \boxed{2}i$
- $(1+i)((1-i)(2+i)) = (1+i)(\boxed{3} + \boxed{-1}i) = \boxed{4} + \boxed{2}i$

## 演習 1-6 解答

- $(1+i)((1+i) + (1-i)) = (1+i)(\boxed{2} + \boxed{0}i) = \boxed{2} + \boxed{2}i$
- $(1+i)(1+i) + (1+i)(1-i) = (\boxed{0} + \boxed{2}i) + (\boxed{2} + \boxed{0}i) = \boxed{2} + \boxed{2}i$
- $(2+3i)(1+0i) = \boxed{2} + \boxed{3}i$
- $(1+i)^2 = \boxed{0} + \boxed{2}i$