



◇「콘텐츠산업 진흥법 시행령」제33조에 의한 표시
1) 제작연월일 : 2018-03-05
2) 제작자 : 교육지대(주)
3) 이 콘텐츠는 「콘텐츠산업 진흥법」에 따라 최초
제작일부터 5년간 보호됩니다.

◇「콘텐츠산업 진흥법」외에도「저작권법」에 의하여 보호
되는 콘텐츠의 경우, 그 콘텐츠의 전부 또는 일부를 무
단으로 복제하거나 전송하는 것은 콘텐츠산업 진흥법
외에도 저작권법에 의한 법적 책임을 질 수 있습니다.

01 복소수의 덧셈과 뺄셈

실수 a, b, c, d 에 대하여

(1) 덧셈: $(a+bi) + (c+di) = (a+c) + (b+d)i$

(2) 뺄셈: $(a+bi) - (c+di) = (a-c) + (b-d)i$

■ 다음 식을 계산하여 $a+bi$ 꼴로 나타내어라. (단, a, b
는 실수, $i = \sqrt{-1}$)

1. $(4-i) + (-8+2i)$

2. $(3+4i) + (2-2i)$

3. $(2-3i) + (2+i)$

4. $(-1+3i) + (4-2i)$

5. $(1+2i) + (2+i)$

6. $(11+3i) + (4+i)$

7. $(2-7i) - (5i-11)$

8. $(5+2i) + 4(5+3i)$

9. $(3-2i) - (-1+2i)$

10. $(3+5i) - (7i-1)$

11. $(1+3i) - (2i-2)$

12. $(-7-2i) - (8-2i)$

13. $(7-2i) - (i-5)$

14. $(11+3i) - (7-4i) + 2i$

15. $(-9i+8) + (8i-5)$

16. $(3+4i) + (3-4i)$

17. $(-3+4i) - (-2i-5)$

18. $(-1-i) + (-4-7i)$

19. $(2+i) - (1+3i)$

20. $(1+i) - (-2-3i)$

21. $(-3+8i) + (2+5i)$

22. $(-1+2i)+(3+2i)$

23. $(-i-1)+(-1+i)$

24. $(10i+10)+(-11i-12)$

25. $(-5-5i)+(-3-2i)$

26. $(1+2i)-(4+5i)$

27. $(-8-i)-(5i+3)$

31. $(2+3i)(3-4i)$

32. $(-1-i)(1-i)$

33. $(1+i)(1-i)$

34. $(3+6i)(5-4i)$

35. $(1-\sqrt{3}i)^2$

36. $(3+i)^2$

37. $(2+3i)^2$

38. $(1-i)^2$

39. $(3-2i)(-1+4i)$

40. $3i(5+4i)$

41. $(2-3i)(-1+2i)$

42. $(1+i)(2-i)$

02 복소수의 곱셈과 나눗셈

실수 a, b, c, d 에 대하여

(1) 곱셈: $(a+bi)(c+di) = \overset{1}{ac} + \overset{2}{adi} + \overset{3}{bci} + \overset{4}{bdi^2} = (ac-bd) + (ad+bc)i$

(2) 나눗셈: $\frac{a+bi}{c+di} = \frac{(a+bi)(c-di)}{(c+di)(c-di)} = \frac{ac+bd}{c^2+d^2} + \frac{bc-ad}{c^2+d^2}i$
(단, $c+di \neq 0$)

■ 다음을 계산하여 $a+bi$ 꼴로 나타내어라. (단, a, b 는 실수, $i = \sqrt{-1}$)

28. $(2+\sqrt{3}i)^2$

29. $(-\sqrt{2}i)^2$

30. $(2+i)^2$

43. $(2-3i)(1+2i)$

44. $(-2+7i)(1-i)$

45. $2i(-4-3i)$

46. $(1+2i)(3-i)$

47. $(1+2i)(2-i)$

48. $(5+6i)(5-6i)$

49. $(1+i)(2+3i)$

50. $(1+2i)(2-3i)$

51. $(2-i)(4+3i)$

52. $(3+2i)(-1+4i)$

53. $(1-2i)(-1+4i)$

54. $(1+2i)(3+5i)$

■ 다음 식을 계산하여 $a+bi$ 꼴로 나타내어라. (단, a, b 는 실수, $i = \sqrt{-1}$)

55. $\frac{5i}{3+i}$

56. $\frac{1-i}{1-2i}$

57. $\frac{2-i}{1+i}$

58. $\frac{1+2i}{1-i}$

59. $\frac{1+3i}{1-i}$

60. $\frac{9i}{1-4i}$

61. $\frac{1+i}{2-i}$

62. $\frac{4+3i}{1+2i}$

63. $\frac{1+i}{1-i}$

$$64. \frac{-2i}{2+\sqrt{2}i}$$

$$65. \frac{3i}{2+i}$$

$$66. \frac{1-i}{1+i}$$

$$67. \frac{3+2i}{2-i}$$

$$68. \frac{3}{\sqrt{2}-i}$$

$$69. \frac{1}{3-4i}$$

$$70. \frac{1}{2+i}$$

$$71. \frac{2-5i}{4+3i}$$

$$72. \frac{i}{1-i}$$

■ 다음을 계산하여라.

$$73. (5+2i) + \frac{1-i}{1+i}$$

$$74. \frac{2}{1-i} + \frac{1-i}{1+i}$$

$$75. 3i - \{-2i + 2(9i-8)\}$$

$$76. (4-i)(3-2i) + (4-i)(3+2i)$$

$$77. (4+2i) \times (1-2i) \div (3-4i)$$

$$78. (3+4i) \left(\frac{3+i}{1+i} \right) + (-1-3i) \left(\frac{3+i}{1+i} \right)$$

$$79. \frac{2+i}{1+3i} + \frac{1}{4-2i}$$

$$80. -\frac{5}{3} - \frac{\sqrt{2}}{3}i - \frac{2}{3} - \frac{\sqrt{2}}{6}i$$

$$81. (3+2i)(2-i) - \frac{6-8i}{1+2i}$$

■ 다음 등식을 만족하는 실수 x, y 의 값을 구하여라.

82. $(2+i)^2x + (2-i)^2y = 9+4i$

83. $(x+2i)(3-i) = 8+yi$

84. $(3-2i)(x+yi) = 13$

85. $(2+i)(x-yi) = -3+i$

86. $(1-2i)(x-yi) = \overline{3-4i}$

87. $\frac{x}{1-i} + \frac{y}{1+i} = 2-i$

88. $\frac{x}{1-i} + \frac{y}{1+i} = 1-i$

89. $\frac{x}{2+i} + \frac{y}{2-i} = (1+i)^2$

90. $\frac{x}{1-2i} + \frac{y}{1+2i} = \frac{10}{3+4i}$

■ 다음을 물음에 답하여라.(단, $i = \sqrt{-1}$)

91. 두 실수 a, b 에 대하여 $\frac{a+i}{1-i} = \overline{1-bi}$ 가 성립할 때, $a+b$ 의 값을 구하여라.

92. 정수 a, b 에 대하여 $(2-ai)(1+i) = -1+bi$ 를 만족할 때, $a+b$ 의 값을 구하여라.

93. 복소수 $z = 1+2i$ 일 때 $z + \frac{10}{z}$ 를 간단히 하여라.

94. $\frac{x}{1+i} + \frac{y}{1-i} = 2$ 를 만족하는 실수 x, y 에 대하여 $x+y$ 의 값을 구하여라.

95. 등식 $(x+2i)(1-i) = 5+yi$ 를 만족시키는 실수 x, y 에 대하여 $x-y$ 의 값을 구하여라. (단, $i = \sqrt{-1}$)



정답 및 해설

1) $-4+i$

$$\Rightarrow (4-i) + (-8+2i) = (4-8) + (-1+2)i \\ = -4+i$$

2) $5+2i$

$$\Rightarrow (3+4i) + (2-2i) = 5+2i$$

3) $4-2i$

$$\Rightarrow (2-3i) + (2+i) = (2+2) + (-3+1)i \\ = 4-2i$$

4) $3+i$

$$\Rightarrow (-1+3i) + (4-2i) = (-1+4) + (3-2)i \\ = 3+i$$

5) $3+3i$

$$\Rightarrow (1+2i) + (2+i) = (1+2) + (2+1)i = 3+3i$$

6) $15+4i$

$$\Rightarrow (11+3i) + (4+i) = (11+4) + (3+1)i = 15+4i$$

7) $13-12i$

$$\Rightarrow (2-7i) - (5i-11) = \{2-(-11)\} + (-7-5)i \\ = 13-12i$$

8) $25+14i$

$$\Rightarrow (5+2i) + 4(5+3i) = 5+2i+20+12i \\ = (5+20) + (2+12)i \\ = 25+14i$$

9) $4-4i$

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

10) $4-2i$

$$\Rightarrow (3+5i) - (7i-1) = (3+1) + (5-7)i = 4-2i$$

11) $3+i$

$$\Rightarrow (1+3i) - (2i-2) = 1+3i-2i+2 = 3+i$$

12) -15

$$\Rightarrow (-7-2i) - (8-2i) = -7-2i-8+2i = -15$$

13) $12-3i$

$$\Rightarrow (7-2i) - (i-5) = (7+5) + (-2-1)i \\ = 12-3i$$

14) $4+9i$

$$\Rightarrow (11+3i) - (7-4i) + 2i = (11-7) + (3+4+2)i \\ = 4+9i$$

15) $3-i$

$$\Rightarrow (-9i+8) + (8i-5) = 3-i$$

16) 6

$$\Rightarrow (3+4i) + (3-4i) = (3+3) + (4-4)i \\ = 6$$

17) $2+6i$

$$\Rightarrow (-3+4i) - (-2i-5) = -3+4i+2i+5 = 2+6i$$

18) $-5-8i$

$$\Rightarrow (-1-i) + (-4-7i) = -5-8i$$

19) $1-2i$

$$\Rightarrow (2+i) - (1+3i) = (2-1) + (1-3)i \\ = 1-2i$$

20) $3+4i$

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

21) $-1+13i$

$$\Rightarrow (-3+8i) + (2+5i) = (-3+2) + (8+5)i = -1+13i$$

22) $2+4i$

$$\Rightarrow (-1+2i) + (3+2i) = (-1+3) + (2+2)i = 2+4i$$

23) -2

$$\Rightarrow (-i-1) + (-1+i) = -2$$

24) $-2-i$

$$\Rightarrow (10i+10) + (-11i-12) = -2-i$$

25) $-8-7i$

$$\Rightarrow (-5-5i) + (-3-2i) = -8-7i$$

26) $-3-3i$

$$\Rightarrow (1+2i) - (4+5i) = 1+2i-4-5i \\ = (1-4) + (2-5)i = -3-3i$$

27) $-11-6i$

$$\Rightarrow (-8-i) - (5i+3) = -8-i-5i-3 = -11-6i$$

28) $1+4\sqrt{3}i$

$$\Rightarrow (2+\sqrt{3}i)^2 = 2^2 + 2 \cdot 2 \cdot \sqrt{3}i + (\sqrt{3}i)^2 \\ = 4 + 4\sqrt{3}i + 3i^2 \\ = 4 + 4\sqrt{3}i - 3 = 1 + 4\sqrt{3}i$$

29) -2

$$\Rightarrow (-\sqrt{2}i)^2 = (-\sqrt{2})^2 i^2 = -2$$

30) $3+4i$

$$\Rightarrow (2+i)^2 = 2^2 + 2 \cdot 2 \cdot i + i^2 = 4+4i-1 = 3+4i$$

31) $18+i$

$$\Rightarrow (2+3i)(3-4i) \\ = \{2 \times 3 - 3 \times (-4)\} + \{2 \times (-4) + 3 \times 3\}i = 18+i$$

32) -2

$$\Rightarrow (-1-i)(1-i) = (-1-1) + (1-1)i = -2$$

33) 2

$$\Rightarrow (1+i)(1-i) = (-1-1) + (1-1)i = 2$$

34) $39+18i$

$$\Rightarrow (3+6i)(5-4i) = (15+24) + (30-12)i = 39+18i$$

35) $-2-2\sqrt{3}i$

$$\Rightarrow (1-\sqrt{3}i)^2 = 1^2 - 2 \cdot 1 \cdot \sqrt{3}i + (\sqrt{3}i)^2 \\ = 1 - 2\sqrt{3}i - 3 = -2 - 2\sqrt{3}i$$

36) $8+6i$

$$\Rightarrow (3+i)^2 = 9 + 6i + i^2 \\ = 9 + 6i - 1 \\ = 8 + 6i$$

37) $-5+12i$

$$\Rightarrow (2+3i)^2 = 2^2 + 2 \cdot 2 \cdot 3i + (3i)^2 \\ = 4 + 12i - 9 = -5 + 12i$$

38) $-2i$

$$\Rightarrow (1-i)^2 = 1^2 - 2 \cdot 1 \cdot i + i^2 = 1 - 2i - 1 = -2i$$

39) $5+14i$

$$\Rightarrow (3-2i)(-1+4i) = -3 + 12i + 2i - 8i^2 = 5 + 14i$$

40) $-12+15i$

$$\Rightarrow 3i(5+4i) = 15i + 12i^2 \\ = -12 + 15i$$

41) $4+7i$

$$\Rightarrow (2-3i)(-1+2i) = -2 + 4i + 3i - 6i^2 \\ = -2 + 7i - (-6) = 4 + 7i$$

42) $3+i$

$$\Rightarrow (1+i)(2-i) = (2+1) + (2-1)i = 3+i$$

43) $8+i$

$$\Rightarrow (2-3i)(1+2i) = (2+6) + (-3+4)i = 8+i$$

44) $5+9i$

$$\Rightarrow (-2+7i)(1-i) = (-2+7) + (7+2)i = 5+9i$$

45) $16-8i$

$$\Rightarrow 12i(-4-3i) = -8i - 6i^2 = 6 - 8i$$

46) $5+5i$

$$\Rightarrow (1+2i)(3-i) = (3+2) + (6-1)i = 5+5i$$

47) $4+3i$

$$\Rightarrow (1+2i)(2-i) = 2 - i + 4i - 2i^2 \\ = 2 + 3i - (-2) = 4 + 3i$$

48) 61

$$\Rightarrow (5+6i)(5-6i) = 5^2 - (6i)^2 = 25 - 36i^2 \\ = 25 - (-36) = 61$$

49) $-1+5i$

$$\Rightarrow (1+i)(2+3i) = 2 + 3i + 2i + 3i^2 \\ = 2 + 5i - 3 = -1 + 5i$$

50) $8+i$

$$\Rightarrow (1+2i)(2-3i) = 2 - 3i + 4i - 6i^2 \\ = 8 + i$$

51) $11+2i$

$$\Rightarrow (2-i)(4+3i) = 8 + 6i - 4i - 3i^2 \\ = 8 + 2i - 3 \cdot (-1) \\ = 11 + 2i$$

52) $-11+10i$

$$\Rightarrow (3+2i)(-1+4i) = -3 + 12i - 2i - 8 = -11 + 10i$$

53) $7+6i$

54) $-7+11i$

$$\Rightarrow (1+2i)(3+5i) = 3 + 5i + 6i - 10 \\ = -7 + 11i$$

55) $\frac{1}{2} + \frac{3}{2}i$

$$\Rightarrow \frac{5i}{3+i} = \frac{5i(3-i)}{(3+i)(3-i)} \\ = \frac{15i - 5i^2}{9 - i^2} = \frac{5 + 15i}{10} = \frac{1}{2} + \frac{3}{2}i$$

56) $\frac{3}{5} + \frac{1}{5}i$

$$\Rightarrow \frac{1-i}{1-2i} = \frac{(1-i)(1+2i)}{(1-2i)(1+2i)} \\ = \frac{1 + 2i - i - 2i^2}{1 - 4i^2} = \frac{3+i}{5} = \frac{3}{5} + \frac{1}{5}i$$

57) $\frac{1}{2} - \frac{3}{2}i$

$$\Rightarrow \frac{2-i}{1+i} = \frac{(2-i)(1-i)}{(1+i)(1-i)} = \frac{1-3i}{2} = \frac{1}{2} - \frac{3}{2}i$$

58) $-\frac{1}{2} + \frac{3}{2}i$

$$\Rightarrow \frac{1+2i}{1-i} = \frac{(1+2i)(1+i)}{(1-i)(1+i)} = \frac{1+i+2i+2i^2}{1-i^2} \\ = \frac{-1+3i}{2} = -\frac{1}{2} + \frac{3}{2}i$$

59) $-1+2i$

$$\Rightarrow \frac{1+3i}{1-i} = \frac{(1+3i)(1+i)}{(1-i)(1+i)} \\ = \frac{1+i+3i+3i^2}{1-i^2} = \frac{-2+4i}{2} = -1 + 2i$$

60) $-\frac{36}{17} + \frac{9}{17}i$

$$\Rightarrow \frac{9i}{1-4i} = \frac{9i(1+4i)}{(1-4i)(1+4i)} = \frac{9i + (-36)}{17} = -\frac{36}{17} + \frac{9}{17}i$$

61) $\frac{1}{5} + \frac{3}{5}i$

\Rightarrow 분모의 켈레복소수 $2+i$ 를 분모, 분자에 곱한다.

$$\frac{1+i}{2-i} = \frac{(1+i)(2+i)}{(2-i)(2+i)} = \frac{2+i+2i+i^2}{2^2-i^2} = \frac{1}{5} + \frac{3}{5}i$$

62) $2-i$

$$\Rightarrow \frac{4+3i}{1+2i} = \frac{(4+3i)(1-2i)}{(1+2i)(1-2i)} \\ = \frac{4-8i+3i-6i^2}{1-4i^2} = \frac{10-5i}{5} = 2-i$$

63) i

$$\Rightarrow \frac{1+i}{1-i} = \frac{(1+i)^2}{(1-i)(1+i)} = \frac{2i}{2} = i$$

$$64) \frac{-\sqrt{2}-2i}{3}$$

$$\Rightarrow \frac{-2i}{2+\sqrt{2}i} = \frac{-2i(2-\sqrt{2}i)}{(2+\sqrt{2}i)(2-\sqrt{2}i)} \\ = \frac{-4i-2\sqrt{2}}{4+2} \\ = \frac{-\sqrt{2}-2i}{3}$$

$$65) \frac{3}{5} + \frac{6}{5}i$$

$$\Rightarrow \frac{3i}{2+i} = \frac{3i(2-i)}{(2+i)(2-i)} = \frac{6i+3}{5} = \frac{3}{5} + \frac{6}{5}i$$

66) $-i$

$$\Rightarrow \frac{1-i}{1+i} = \frac{(1-i)^2}{(1+i)(1-i)} = \frac{1-2i+i^2}{1-i^2} = \frac{-2i}{2} = -i$$

$$67) \frac{4}{5} + \frac{7}{5}i$$

$$\Rightarrow \frac{3+2i}{2-i} = \frac{(3+2i)(2+i)}{(2-i)(2+i)} = \frac{6+3i+4i+2i^2}{4-i^2} \\ = \frac{4+7i}{5} = \frac{4}{5} + \frac{7}{5}i$$

$$68) \sqrt{2}+i$$

$$\Rightarrow \frac{3}{\sqrt{2}-i} = \frac{3(\sqrt{2}+i)}{(\sqrt{2}-i)(\sqrt{2}+i)} \\ = \frac{3\sqrt{2}+3i}{2-i^2} = \frac{3\sqrt{2}+3i}{3} = \sqrt{2}+i$$

$$69) \frac{3}{25} + \frac{4}{25}i$$

$$\Rightarrow \frac{1}{3-4i} = \frac{3+4i}{(3-4i)(3+4i)} = \frac{3+4i}{25} = \frac{3}{25} + \frac{4}{25}i$$

$$70) \frac{2}{5} - \frac{1}{5}i$$

$$\Rightarrow \frac{1}{2+i} = \frac{2-i}{(2+i)(2-i)} = \frac{2-i}{5} = \frac{2}{5} - \frac{1}{5}i$$

$$71) -\frac{7}{25} - \frac{26}{25}i$$

$$\Rightarrow \frac{2-5i}{4+3i} = \frac{(2-5i)(4-3i)}{(4+3i)(4-3i)} = \frac{(8-15)+(-20-6)i}{16+9} \\ = \frac{-7-26i}{25} = -\frac{7}{25} - \frac{26}{25}i$$

$$72) -\frac{1}{2} + \frac{i}{2}$$

$$\Rightarrow \frac{i}{1-i} = \frac{i(1+i)}{(1-i)(1+i)} = \frac{-1+i}{2}$$

$$73) 5+i$$

$$74) 1$$

$$\Rightarrow \frac{2}{1-i} + \frac{1-i}{1+i} = \frac{2(1+i)+(1-i)^2}{(1-i)(1+i)} \\ = \frac{2+2i+1-2i-1}{2} = \frac{2}{2} = 1$$

$$75) 16-13i$$

$$\Rightarrow 3i - \{-2i + 2(9i-8)\} = 3i - (16i-16) = 16-13i$$

$$76) 24-6i$$

$$\Rightarrow (4-i)(3-2i) + (4-i)(3+2i) \\ = 12-8i-3i-2+12+8i-3i+2 = 24-6i$$

$$77) \frac{48+14i}{25}$$

$$\Rightarrow (4+2i) \times (1-2i) \div (3-4i) \\ = \frac{(4+2i)(1-2i)}{3-4i} = \frac{8-6i}{3-4i} \\ = \frac{(8-6i)(3+4i)}{(3-4i)(3+4i)} = \frac{48+14i}{25}$$

$$78) 5$$

$$\Rightarrow \frac{3+i}{1+i} = \frac{(3+i)(1-i)}{(1+i)(1-i)} \\ = \frac{3-3i+i-i^2}{1-i^2} = \frac{4-2i}{2} = 2-i$$

이므로

$$(3+4i)\left(\frac{3+i}{1+i}\right) + (-1-3i)\left(\frac{3+i}{1+i}\right) \\ = (3+4i)(2-i) + (-1-3i)(2-i) \\ = (2-i)\{(3+4i) + (-1-3i)\} \\ = (2-i)(2+i) \\ = 4-i^2 = 5$$

$$79) \frac{7-4i}{10}$$

$$\Rightarrow \frac{2+i}{1+3i} + \frac{1}{4-2i} = \frac{(2+i)(4-2i) + (1+3i)}{(1+3i)(4-2i)} \\ = \frac{10+(1+3i)}{10+10i} \\ = \frac{(11+3i)(10-10i)}{(10+10i)(10-10i)} \\ = \frac{140-80i}{200} = \frac{7-4i}{10}$$

$$80) -\frac{7}{3} - \frac{\sqrt{2}}{2}i$$

$$\Rightarrow -\frac{5}{3} - \frac{\sqrt{2}}{3}i - \frac{2}{3} - \frac{\sqrt{2}}{6}i \\ = \left(-\frac{5}{3} - \frac{2}{3}\right) - \left(\frac{\sqrt{2}}{3} + \frac{\sqrt{2}}{6}\right)i = -\frac{7}{3} - \frac{\sqrt{2}}{2}i$$

81) $10+5i$

$$\begin{aligned}\Rightarrow (3+2i)(2-i) - \frac{6-8i}{1+2i} &= (8+i) - \frac{(6-8i)(1-2i)}{(1+2i)(1-2i)} \\ &= (8+i) - \frac{-10-20i}{5} \\ &= 8+i+(2+4i)=10+5i\end{aligned}$$

82) $x=2, y=1$

$$\Rightarrow (2+i)^2 = 4+4i+i^2 = 3+4i$$

$$(2-i)^2 = 4-4i+i^2 = 3-4i$$

$$\begin{aligned}\therefore (2+i)^2x + (2-i)^2y \\ &= (3+4i)x + (3-4i)y \\ &= (3x+3y) + (4x-4y)i\end{aligned}$$

복소수가 서로 같을 조건에 의하여

$$3x+3y=9, 4x-4y=4$$

$$\therefore x+y=3, x-y=1$$

두 식을 연립하여 풀면 $x=2, y=1$

83) $x=2, y=4$

$$\Rightarrow (x+2i)(3-i) = 8+yi \text{에서}$$

$$(3x+2) + (-x+6)i = 8+yi$$

복소수가 서로 같을 조건에 의해

$$3x+2=8, -x+6=y \text{이므로 } x=2, y=4$$

84) $x=3, y=2$

$$\Rightarrow (3-2i)(x+yi) = 13 \text{에서}$$

$$(3x+2y) + (-2x+3y)i = 13$$

복소수가 서로 같을 조건에 의해

$$3x+2y=13, -2x+3y=0$$

위의 두 식을 연립하여 풀면 $x=3, y=2$

85) $x=-1, y=-1$

$$\Rightarrow (2+i)(x-yi) = -3+i \text{에서}$$

$$(2x+y) + (x-2y)i = -3+i$$

복소수가 서로 같을 조건에 의해

$$2x+y=-3, x-2y=1$$

위의 두 식을 연립하여 풀면 $x=-1, y=-1$

86) $x=-1, y=-2$

$$\Rightarrow (1-2i)(x-yi) = 3-4i \text{에서}$$

$$(x-2y) + (-2x-y)i = 3+4i$$

복소수가 서로 같을 조건에 의해

$$x-2y=3, -2x-y=4 \text{이므로 } x=-1, y=-2$$

87) $x=1, y=3$

$$\Rightarrow \frac{x}{1-i} + \frac{y}{1+i} = 2-i \text{에서}$$

$$\begin{aligned}\frac{x}{1-i} + \frac{y}{1+i} &= \frac{x(1+i) + y(1-i)}{(1-i)(1+i)} \\ &= \frac{(x+y) + (x-y)i}{2}\end{aligned}$$

이므로 $\frac{x+y}{2} + \frac{x-y}{2}i = 2-i$ 에서 복소수가 서로

같을 조건에 의해 $\frac{x+y}{2} = 2, \frac{x-y}{2} = -1$

$$\therefore x+y=4, x-y=-2$$

위의 두 식을 연립하여 풀면 $x=1, y=3$

88) $x=0, y=2$

$$\begin{aligned}\Rightarrow \frac{x}{1-i} + \frac{y}{1+i} &= \frac{x(1+i) + y(1-i)}{(1-i)(1+i)} \\ &= \frac{(x+y) + (x-y)i}{2} \\ &= \frac{x+y}{2} + \frac{x-y}{2}i = 1-i\end{aligned}$$

복소수가 서로 같을 조건에 의하여

$$\frac{x+y}{2} = 1, \frac{x-y}{2} = -1 \quad \therefore x+y=2, x-y=-2$$

두 식을 연립하여 풀면 $x=0, y=2$

89) $x=-5, y=5$

$$\Rightarrow (1+i)^2 = 1+2i+i^2 = 2i$$

$$\begin{aligned}\frac{x}{2+i} + \frac{y}{2-i} &= \frac{x(2-i) + y(2+i)}{(2+i)(2-i)} = \frac{(2x+2y) + (-x+y)i}{5} \\ &= \frac{2x+2y}{5} + \frac{-x+y}{5}i = 2i\end{aligned}$$

복소수가 서로 같을 조건에 의하여

$$\frac{2x+2y}{5} = 0, \frac{-x+y}{5} = 2 \quad \therefore x+y=0, -x+y=10$$

두 식을 연립하여 풀면 $x=-5, y=5$

90) $x=1, y=5$

$$\Rightarrow \frac{x}{1-2i} + \frac{y}{1+2i} = \frac{10}{3+4i} \text{에서}$$

$$\begin{aligned}\frac{x}{1-2i} + \frac{y}{1+2i} &= \frac{x(1+2i) + y(1-2i)}{(1-2i)(1+2i)} \\ &= \frac{(x+y) + (2x-2y)i}{5}\end{aligned}$$

$$\frac{10}{3+4i} = \frac{10(3-4i)}{(3+4i)(3-4i)} = \frac{10(3-4i)}{25} = \frac{6-8i}{5}$$

복소수가 서로 같을 조건에 의해

$$x+y=6, 2x-2y=-8 \text{이므로 } x=1, y=5$$

91) 5

$$\begin{aligned}\Rightarrow \frac{a+i}{1-i} &= \frac{(a+i)(1+i)}{(1-i)(1+i)} \\ &= \frac{a+ai+i-1}{2} \\ &= \frac{(a-1) + (a+1)i}{2}\end{aligned}$$

$$\overline{1-bi} = 1+bi$$

$$\frac{a+i}{1-i} = \overline{1-bi} \text{ 이므로}$$

$$\frac{(a-1) + (a+1)i}{2} = 1+bi$$

$$\therefore \frac{a-1}{2} = 1, \frac{a+1}{2} = b$$

$$\therefore a=3, b=2$$

$$\therefore a+b=5$$

92) 2

$$\Rightarrow (2-ai)(1+i) = (2+a) + (-a+2)i = -1+bi \text{이므로}$$

$$2+a=-1 \text{에서 } a=-3 \text{이고}$$

$-a+2=b$ 에서 $b=5$ 이다.

따라서 $a+b=2$ 이다.

93) $3-2i$

$\Rightarrow z=1+2i$ 이면

$$\begin{aligned} z + \frac{10}{z} &= 1+2i + \frac{10}{1+2i} \\ &= 1+2i + \frac{10(1-2i)}{(1+2i)(1-2i)} \\ &= 1+2i + 2-4i \\ &= 3-2i \end{aligned}$$

94) 4

95) 4

$\Rightarrow (x+2i)(1-i)=5+yi$ 에서

$$(x+2)+(-x+2)i=5+yi$$

복소수가 서로 같을 조건에 의해

$$x+2=5, -x+2=y$$

따라서 $x=3, y=-1$ 이므로 $x-y=4$