



◇「콘텐츠산업 진흥법 시행령」제33조에 의한 표시

1) 제작연월일 : 2018-03-05

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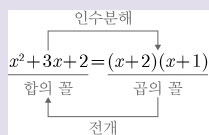
3) 이 콘텐츠는 「콘텐츠산업 진흥법」에 따라 최초 제작일부터 5년간 보호됩니다.

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

## 01 / 인수분해

## 1. 인수분해

하나의 다항식을 두 개 이상의 다항식의 곱의 꼴로 나타내는 것



## 2. 인수분해 기본공식

(1)  $ma + mb = m(a+b)$ ,  $ma - mb = m(a-b)$

(2)  $a^2 + 2ab + b^2 = (a+b)^2$ ,  $a^2 - 2ab + b^2 = (a-b)^2$

(3)  $a^2 - b^2 = (a+b)(a-b)$

(4)  $x^2 + (a+b)x + ab = (x+a)(x+b)$

(5)  $acx^2 + (ad+bc)x + bd = (ax+b)(cx+d)$

■ 다음 식을 인수분해하여라.

1.  $-abc + a$

2.  $ax + bx$

3.  $x - xy$

4.  $2ab^2 + 6b$

5.  $ax^2y + axy^2$

6.  $a^3 - 16ab^2$

7.  $ay + by - cy$

8.  $(a-b)c + b(b-a)$

9.  $a(x-y) - b(y-x)$

10.  $1 - m - n + mn$

11.  $ac - bd - ad + bc$

12.  $ab + a + b + 1$

13.  $(x+1)y^2 + (x+1)y$

14.  $a(b-1) - b + 1$

15.  $(a+b)^2 + 2(a+b)$

16.  $ax + by - ay - bx$

17.  $3ab - 6a^2b + 15a^2b^2$

18.  $(x-y)^2 - 3y(y-x)$

19.  $x^2y + y^2z - y^3 - x^2z$

20.  $x^2 - y^2 + xz - yz$

21.  $x^3y - xy^3$

22.  $xy + y^2 - xz - yz$

23.  $(x-1)a + (x-1)$

24.  $x^3y - x^3$

25.  $1 - m - n + mn$

26.  $16a^2 - 24ab + 9b^2$

27.  $9x^2 + 6x + 1$

28.  $x^2 - 16y^2$

29.  $16x^2 - y^2$

30.  $25x^2 - y^2$

31.  $27a^2 - 12b^2$

32.  $(x+2)^2 - (x-1)^2$

33.  $64x^2 - 9y^2$

34.  $x^2 - 4$

35.  $a^2 - 4b^2$

36.  $x^2 - 9$

37.  $9a^2 - 16b^2$

38.  $a^4 - b^4$

39.  $a^2 - (b-c)^2$

40.  $a^2 + 2ab + b^2 - c^2$

41.  $a^2 - 9b^2$

42.  $-25x^2 + 1$

43.  $\frac{1}{4}x^2 - y^2$

44.  $6a^2 - 13a - 5$

45.  $x^2 + 10x + 21$

46.  $x^2 + 3x + 2$

47.  $2x^2 - x - 3$

48.  $x^2 - 8x + 7$

49.  $3a^2 + 4a - 7$

50.  $x^2 - 10x + 21$

51.  $x^2 - 2xy - 8y^2$

52.  $13a^2 - 8ab - 5b^2$

53.  $x^2 + 12x + 36$

54.  $9x^2 - 6x + 1$

55.  $3a^2 + 4ab - 7b^2$

56.  $2x^2 + xy - 3y^2$

57.  $9x^2 - 24xy + 16y^2$

58.  $a^2 + 10ab + 25b^2$

59.  $x^2 - 2 + \frac{1}{x^2}$

60.  $x^2 - 10x + 25$

61.  $x^2 + x + \frac{1}{4}$

62.  $4x^2 + 4x + 1$

63.  $x^2 - \frac{2}{5}x + \frac{1}{25}$

64.  $5x^2 + x - 18$

65.  $a^2 + 2a + 1$

66.  $x^2 + 4x + 3$

67.  $a^2 - ab - 20b^2$

68.  $5a^2 - 8ab - 4b^2$

69.  $x^2 - 6xy + 8y^2$

70.  $a^2 + 10ab + 21b^2$

71.  $4x^2 + 3x - 1$

72.  $3x^2 + 11xy - 4y^2$

73.  $x^2 - 6x + 8$

74.  $x^2 + \frac{2}{3}x + \frac{1}{9}$

75.  $4a^2 + 28ab + 49b^2$

76.  $25x^2 - 30xy + 9y^2$

77.  $x^2 + 6x + 9$

78.  $25a^2 - 10a + 1$

79.  $x^2 - 8x + 16$

80.  $4x^2 + 12xy + 9y^2$

81.  $x^2 - 5xy + \frac{25}{4}y^2$

82.  $4abx^2 - 4ab^2xy + ab^3y^2$



## 정답 및 해설

- 1)  $a(1-bc)$
- 2)  $x(a+b)$
- 3)  $x(1-y)$
- 4)  $2b(ab+3)$
- 5)  $axy(x+y)$
- 6)  $a(a+4b)(a-4b)$   
 $\Rightarrow a^3-16ab^2 = a(a^2-16b^2) = a(a+4b)(a-4b)$
- 7)  $y(a+b-c)$
- 8)  $-(a-b)(b-c)$   
 $\Rightarrow (a-b)c+b(b-a) = (a-b)(c-b)$   
 $= -(a-b)(b-c)$
- 9)  $(a+b)(x-y)$   
 $\Rightarrow a(x-y)-b(y-x) = a(x-y)+b(x-y)$   
 $= (a+b)(x-y)$
- 10)  $(1-m)(1-n)$   
 $\Rightarrow 1-m-n+mn = 1-m-n(1-m)$   
 $= (1-m)(1-n)$
- 11)  $(c-d)(a+b)$   
 $\Rightarrow ac-bd-ad+bc = a(c-d)+b(c-d) = (c-d)(a+b)$
- 12)  $(a+1)(b+1)$
- 13)  $y(x+1)(y+1)$
- 14)  $(a-1)(b-1)$
- 15)  $(a+b)(a+b+2)$
- 16)  $(a-b)(x-y)$
- 17)  $3ab(1-2a+5ab)$
- 18)  $(x-y)(x+2y)$   
 $\Rightarrow (x-y)^2-3y(y-x) = (x-y)\{(x-y)+3y\}$   
 $= (x-y)(x+2y)$
- 19)  $(x+y)(x-y)(y-z)$   
 $\Rightarrow x^2y+y^2z-y^3-x^2z = x^2(y-z)-y^2(y-z)$   
 $= (y-z)(x^2-y^2)$   
 $= (x+y)(x-y)(y-z)$
- 20)  $(x-y)(x+y+z)$   
 $\Rightarrow x^2-y^2+xz-yz = (x+y)(x-y)+z(x-y)$   
 $= (x-y)(x+y+z)$
- 21)  $xy(x+y)(x-y)$
- 22)  $(x+y)(y-z)$

- $$\Rightarrow xy+y^2-xz-yz = y(x+y)-z(x+y) = (x+y)(y-z)$$
- 23)  $(x-1)(a+1)$
  - 24)  $x^3(y-1)$
  - 25)  $(1-m)(1-n)$   
 $\Rightarrow 1-m-n+mn = (1-m)-n(1-m)$   
 $= (1-m)(1-n)$
  - 26)  $(4a-3b)^2$   
 $\Rightarrow 16a^2-24ab+9b^2 = (4a)^2-2\cdot 4a\cdot 3b+(3b)^2$   
 $= (4a-3b)^2$
  - 27)  $(3x+1)^2$   
 $\Rightarrow 9x^2+6x+1 = (3x)^2+2\cdot 3x\cdot 1+1^2$   
 $= (3x+1)^2$
  - 28)  $(x+4y)(x-4y)$
  - 29)  $(4x+y)(4x-y)$
  - 30)  $(5x+y)(5x-y)$   
 $\Rightarrow 25x^2-y^2 = (5x)^2-y^2$   
 $= (5x+y)(5x-y)$
  - 31)  $3(3a+2b)(3a-2b)$   
 $\Rightarrow 27a^2-12b^2 = 3(9a^2-4b^2) = 3\{(3a)^2-(2b)^2\}$   
 $= 3(3a+2b)(3a-2b)$
  - 32)  $3(2x+1)$   
 $\Rightarrow (x+2)^2-(x-1)^2 = (x+2+x-1)(x+2-x+1)$   
 $= 3(2x+1)$
  - 33)  $(8x+3y)(8x-3y)$
  - 34)  $(x+2)(x-2)$
  - 35)  $(a+2b)(a-2b)$
  - 36)  $(x+3)(x-3)$
  - 37)  $(3a+4b)(3a-4b)$
  - 38)  $(a-b)(a+b)(a^2+b^2)$   
 $\Rightarrow a^4-b^4 = (a^2-b^2)(a^2+b^2)$   
 $= (a-b)(a+b)(a^2+b^2)$
  - 39)  $(a+b-c)(a-b+c)$
  - 40)  $(a+b+c)(a+b-c)$
  - 41)  $(a+3b)(a-3b)$
  - 42)  $-(5x+1)(5x-1)$
  - 43)  $\left(\frac{1}{2}x+y\right)\left(\frac{1}{2}x-y\right)$

44)  $(3a+1)(2a-5)$

45)  $(x+3)(x+7)$

46)  $(x+1)(x+2)$

47)  $(2x-3)(x+1)$

48)  $(x-1)(x-7)$

49)  $(3a+7)(a-1)$

50)  $(x-3)(x-7)$

51)  $(x-4y)(x+2y)$

52)  $(13a+5b)(a-b)$

53)  $(x+6)^2$

54)  $(3x-1)^2$

55)  $(3a+7b)(a-b)$

56)  $(2x+3y)(x-y)$

57)  $(3x-4y)^2$

58)  $(a+5b)^2$

59)  $\left(x - \frac{1}{x}\right)^2$

60)  $(x-5)^2$

61)  $\left(x + \frac{1}{2}\right)^2$

62)  $(2x+1)^2$

63)  $\left(x - \frac{1}{5}\right)^2$

64)  $(x+2)(5x-9)$

65)  $(a+1)^2$

66)  $(x+1)(x+3)$

67)  $(a+4b)(a-5b)$

68)  $(5a+2b)(a-2b)$

69)  $(x-2y)(x-4y)$

70)  $(a+3b)(a+7b)$

71)  $(4x-1)(x+1)$

72)  $(3x-y)(x+4y)$

73)  $(x-2)(x-4)$

74)  $\left(x + \frac{1}{3}\right)^2$

75)  $(2a+7b)^2$

76)  $(5x-3y)^2$

77)  $(x+3)^2$

78)  $(5a-1)^2$

79)  $(x-4)^2$

80)  $(2x+3y)^2$

81)  $\left(x - \frac{5}{2}y\right)^2$

82)  $ab(2x-by)^2$

$$\Rightarrow 4abx^2 - 4ab^2xy + ab^3y^2 = ab(4x^2 - 4bxy + b^2y^2)$$

$$= ab(2x-by)^2$$