

式の展開と因数分解⑥ (解答と解説)

1 [解答] (1) $-12ab - 20b^2$ (2) $15a^2 + a - 2$ (3) $x^2 + 6x + 5$
 (4) $a^2 - 8a + 16$ (5) $25 - x^2$ (6) $4a^2 - 12ab + 9b^2 - 6a + 9b - 4$

(1) $(3a + 5b) \times (-4b) = 3a \times (-4b) + 5b \times (-4b)$
 $= -12ab - 20b^2$

(2) $(5a + 2)(3a - 1) = 15a^2 - 5a + 6a - 2$
 $= 15a^2 + a - 2$

(3) $(x + 1)(x + 5) = x^2 + (1 + 5)x + 1 \times 5$
 $= x^2 + 6x + 5$

(4) $(a - 4)^2 = a^2 - 2 \times 4 \times a + 4^2$
 $= a^2 - 8a + 16$

(5) $(5 + x)(5 - x) = 5^2 - x^2$
 $= 25 - x^2$

(6) $(2a - 3b + 1)(2a - 3b - 4) = \{(2a - 3b) + 1\}\{(2a - 3b) - 4\}$
 $= (2a - 3b)^2 - 3(2a - 3b) - 4$
 $= 4a^2 - 12ab + 9b^2 - 6a + 9b - 4$

2 [解答] (1) $2xy(5x - 1)$ (2) $(x - 3)(x - 4)$ (3) $(x + 3)(x + 6)$
 (4) $\left(x - \frac{1}{2}\right)^2$ (5) $(8 + t)(8 - t)$ (6) $(x + 5)(x + 8)$

(1) $10x^2y - 2xy = 2xy \times 5x - 2xy \times 1$
 $= 2xy(5x - 1)$

(2) $x^2 - 7x + 12 = x^2 + \{(-3) + (-4)\}x + (-3) \times (-4)$
 $= (x - 3)(x - 4)$

(3) $x^2 + 9x + 18 = (x + 3)(x + 6)$

(4) $x^2 - x + \frac{1}{4} = x^2 - 2 \times \frac{1}{2} \times x + \left(\frac{1}{2}\right)^2$
 $= \left(x - \frac{1}{2}\right)^2$

(5) $64 - t^2 = 8^2 - t^2$
 $= (8 + t)(8 - t)$

(6) $(x + 3)^2 + 7(x + 3) + 10 = \{(x + 3) + 2\}\{(x + 3) + 5\}$

$$= (x + 5)(x + 8)$$

3 [解答] (1) 2496 (2) 2601

(1) $52 \times 48 = (50 + 2)(50 - 2)$
 $= 50^2 - 2^2$
 $= 2500 - 4$
 $= 2496$

(2) $51^2 = (50 + 1)^2$
 $= 50^2 + 2 \times 1 \times 50 + 1^2$
 $= 2500 + 100 + 1$
 $= 2601$

4 [解答] 15

225 を素因数分解すると $225 = 3 \times 3 \times 5 \times 5$

$3 \times 3 \times 5 \times 5 = (3 \times 5) \times (3 \times 5) = 15^2$ であるから、225 は 15 の 2 乗になる。