
因数分解の応用 (置き換え・発展) I

学習日 月 日

/ 点

1 次の式を、 $x - 4 = M$ と置いて因数分解しなさい。

(1) $(x - 4)^2 + 3(x - 4) + 2$

(2) $(x - 4)^2 - 5(x - 4) - 6$

2 次の式を工夫して因数分解しなさい。

(1) $x^2 - 6x + 9 - y^2$

(2) $a^4 - 81$

(3) $(x + y)^2 - 25$

(4) $ax + 2ay + 3x + 6y$

解答

$$\begin{aligned}
 (1) \quad & M^2 + 3M + 2 \\
 &= (M + 1)(M + 2) \\
 &= (x - 4 + 1)(x - 4 + 2) \\
 &= (x - 3)(x - 2)
 \end{aligned}$$

$$\begin{aligned}
 (2) \quad & M^2 - 5M - 6 \\
 &= (M - 6)(M + 1) \\
 &= (x - 4 - 6)(x - 4 + 1) \\
 &= (x - 10)(x - 3)
 \end{aligned}$$

2

$$\begin{aligned}
 (1) \quad & (x - 3)^2 - y^2 \\
 & \quad x - 3 = M \text{ とおく} \\
 & M^2 - y^2 = (M + y)(M - y) \\
 & \quad = (x + y - 3)(x - y - 3) \\
 (2) \quad & (a^2)^2 - 9^2 = (a^2 + 9)(a^2 - 9) \\
 & \quad = (a^2 + 9)(a + 3)(a - 3)
 \end{aligned}$$

$$\begin{aligned}
 (3) \quad & x - y = M \text{ とおく} \\
 & M^2 - 25 = (M + 5)(M - 5) \\
 & \quad = (x - y + 5)(x - y - 5)
 \end{aligned}$$

$$\begin{aligned}
 (4) \quad & a(x + 2y) + 3(x + 2y) \\
 & \quad x + 2y = M \text{ とおく} \\
 & aM + 3M = M(a + 3) \\
 & \quad = (x + 2y)(a + 3)
 \end{aligned}$$