

## 因数分解(難関)②

次の式を因数分解しなさい。

- (1)  $x^2y - 7xy^2 - 18y^3$
- (2)  $x(x - 2) + 3(x - 4)$
- (3)  $(a + b)^2 - (b - c)^2$
- (4)  $(x^2 + 6)^2 + 12x(x^2 + 6) + 35x^2$
- (5)  $x^2 - 2xy + y^2 - 3x + 3y - 4$

### 解答

$$\begin{aligned}(1) \quad & x^2y - 7xy^2 - 18y^3 \\&= y(x^2 - 7xy - 18y^2) \\&\equiv y(x - 9y)(x + 2y)\end{aligned}$$

$$\begin{aligned}(2) \quad & x(x - 2) + 3(x - 4) \\&= x^2 - 2x + 3x - 12 \\&= x^2 + x - 12 \\&\equiv (x + 4)(x - 3)\end{aligned}$$

$$\begin{aligned}(3) \quad & (a + b)^2 - (b - c)^2 \\&= \{(a + b) + (b - c)\}\{(a + b) - (b - c)\} \\&\equiv (a + 2b - c)(a + c)\end{aligned}$$

$$(4) \quad (x^2 + 6)^2 + 12x(x^2 + 6) + 35x^2$$

$$\begin{aligned}&x^2 + 6 = M \text{ とすると} \\&= M^2 + 12Mx + 35x^2 \\&= (M + 7x)(M + 5x) \\&= (x^2 + 7x + 6)(x^2 + 5x + 6) \\&\equiv (x + 1)(x + 2)(x + 3)(x + 6)\end{aligned}$$

$$\begin{aligned}(5) \quad & x^2 - 2xy + y^2 - 3x + 3y - 4 \\&= (x - y)^2 - 3(x - y) - 4\end{aligned}$$

$$\begin{aligned}&x - y = M \text{ とすると} \\&= M^2 - 3M - 4 \\&= (M - 4)(M + 1) \\&\equiv (x - y - 4)(x - y + 1)\end{aligned}$$