

# まず部分的に因数分解する問題

学習日 月 日

年 組 番 氏名

## POINT

$(a+b)(c+d) = \underline{ac} + \underline{ad} + \underline{bc} + \underline{bd}$  より

$ac + ad + bc + bd = a(c+d) + b(c+d)$

ここで、 $c+d=A$  とおくと

$aA + bA = A(a+b) = (c+d)(a+b)$  と因数分解できる。

(1) 次の  にあてはまる数や式を書きなさい。

$$\begin{aligned} \textcircled{1} \quad xy + x + y + 1 &= (xy + \boxed{\phantom{00}}) + (y + 1) \\ &= x(\boxed{\phantom{00}}) + (y + 1) \\ &= (\boxed{\phantom{00}})(y + 1) \end{aligned}$$

$$\begin{aligned} \textcircled{2} \quad x^2 + 2xy + y^2 - 4 &= (\boxed{\phantom{0000}}) - 4 \\ &= (\boxed{\phantom{00}})^2 - 4 \\ &= (\boxed{\phantom{00}} + 2)(\boxed{\phantom{00}} - 2) \end{aligned}$$

$$\begin{aligned} \textcircled{3} \quad a^2 - b^2 - 6b - 9 &= a^2 - (\boxed{\phantom{0000}}) \\ &= a^2 - (\boxed{\phantom{00}})^2 \\ &= \{a + (\boxed{\phantom{00}})\} \{a - (\boxed{\phantom{00}})\} \\ &= (a + \boxed{\phantom{00}})(a - \boxed{\phantom{00}}) \end{aligned}$$

$$\begin{aligned} \textcircled{4} \quad ab^2 + 9 - a - 9b^2 &= ab^2 - \boxed{\phantom{00}} - (9b^2 - \boxed{\phantom{00}}) \\ &= \boxed{\phantom{00}}(b^2 - 1) - 9(\boxed{\phantom{00}}) \\ &= (\boxed{\phantom{00}} - 9)(b^2 - 1) \\ &= (\boxed{\phantom{00}} - 9)(\boxed{\phantom{00}})(\boxed{\phantom{00}}) \end{aligned}$$

(2) 次の式を因数分解しなさい。

①  $xy - x + y - 1$

②  $xy - 3x + 2y - 6$

③  $a^2 - bc + ab - ac$

④  $a^2 - bc - b^2 + ac$

⑤  $a^2 + 2a - b^2 + 2b$

⑥  $4x^2 - 12xy + 9y^2 - 9$

⑦  $a^2 + b^2 - c^2 + 2ab$

⑧  $x^2y + 4x^2 - y - 4$

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## POINT

$(a+b)(c+d) = \underline{ac} + \underline{ad} + \underline{bc} + \underline{bd}$  より  
 $ac + ad + bc + bd = a(c+d) + b(c+d)$   
 ここで、 $c+d=A$  とおくと  
 $aA + bA = A(a+b) = (c+d)(a+b)$  と因数分解できる。

(1) 次の  にあてはまる数や式を書きなさい。

$$\begin{aligned}
 \textcircled{1} \quad xy + x + y + 1 &= (xy + \boxed{x}) + (y + 1) \\
 &= x(\boxed{y + 1}) + (y + 1) \\
 &= (\boxed{x + 1})(y + 1)
 \end{aligned}$$

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

$$\begin{aligned}
 \textcircled{3} \quad a^2 - b^2 - 6b - 9 &= a^2 - (\boxed{b^2 + 6b + 9}) \\
 &= a^2 - (\boxed{b + 3})^2 \\
 &= \left\{ a + (\boxed{b + 3}) \right\} \left\{ a - (\boxed{b + 3}) \right\} \\
 &= (a + \boxed{b + 3})(a - \boxed{b - 3})
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{4} \quad ab^2 + 9 - a - 9b^2 &= ab^2 - \boxed{a} - (9b^2 - \boxed{9}) \\
 &= \boxed{a}(b^2 - 1) - 9(\boxed{b^2 - 1}) \\
 &= (\boxed{a} - 9)(b^2 - 1) \\
 &= (\boxed{a} - 9)(\boxed{b + 1})(\boxed{b - 1})
 \end{aligned}$$

(2) 次の式を因数分解しなさい。

$$\begin{aligned}
 \textcircled{1} \quad xy - x + y - 1 &= x(y - 1) + (y - 1) \\
 &= (x + 1)(y - 1)
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{2} \quad xy - 3x + 2y - 6 &= x(y - 3) + 2(y - 3) \\
 &= (x + 2)(y - 3)
 \end{aligned}$$

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

$$\begin{aligned}
 \textcircled{4} \quad a^2 - bc - b^2 + ac &= a^2 - b^2 + c(a - b) \\
 &= (a - b)(a + b + c)
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{5} \quad a^2 + 2a - b^2 + 2b &= a^2 - b^2 + 2(a + b) \\
 &= (a + b)(a - b + 2)
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{6} \quad 4x^2 - 12xy + 9y^2 - 9 &= (2x - 3y)^2 - 9 \\
 &= (2x - 3y + 3)(2x - 3y - 3)
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{7} \quad a^2 + b^2 - c^2 + 2ab &= a^2 + 2ab + b^2 - c^2 \\
 &= (a + b + c)(a + b - c)
 \end{aligned}$$

$$\begin{aligned}
 \textcircled{8} \quad x^2y + 4x^2 - y - 4 &= y(x^2 - 1) + 4(x^2 - 1) \\
 &= (y + 4)(x + 1)(x - 1)
 \end{aligned}$$