

反射テスト 文字式 因数分解 応用 ランダム 02

1. 次の式を因数分解せよ。(S級1分50秒, A級2分20秒, B級3分, C級4分30秒)

(1) $4x^2 + 12x - 40$

(2) $-x^2 - 27xy - 50y^2$

(3) $81x^2 - 36y^2$

(4) $a^2 + b^2 - 2ab - 1$

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

(6) $\frac{2}{5}x^2 - 0.8x - \frac{1}{2}$

(7) $a^4 - 8a^2 + 16$

(8) $x^2 - 2xy + y^2 + x - y - 2$

2. 次の式を因数分解せよ. (S 級 1 分 40 秒, A 級 2 分 20 秒, B 級 3 分, C 級 4 分 30 秒)

(1) $4x^2 + 36x - 40$

(2) $-x^2 - 15xy - 50y^2$

(3) $36x^2 - 81y^2$

(4) $a^2 - b^2 - 2b - 1$

(5) $ab - 3a - b + 3$

(6) $\frac{1}{2}x^2 - 0.8x - \frac{2}{5}$

(7) $a^4 - 18a^2 + 81$

(8) $x^2 - 2xy + y^2 - x + y - 2$

反射テスト 文字式 因数分解 応用 ランダム 02 解答解説

1. 次の式を因数分解せよ。(S級1分50秒, A級2分20秒, B級3分, C級4分30秒)

$$(1) \quad 4x^2 + 12x - 40$$

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

$$(2) \quad -x^2 - 27xy - 50y^2$$

$$\begin{aligned} &= -(x^2 + 27xy + 50y^2) \\ &= \mathbf{-(x + 2y)(x + 25y)} \end{aligned}$$

$$(3) \quad 81x^2 - 36y^2$$

$$\begin{aligned} &= 9(9x^2 - 4y^2) \\ &= \mathbf{9(3x + 2y)(3x - 2y)} \end{aligned}$$

$$(4) \quad a^2 + b^2 - 2ab - 1$$

$$\begin{aligned} &= (a^2 - 2ab + b^2) - 1 \\ &= (a - b)^2 - 1^2 \\ &= \mathbf{(a - b + 1)(a - b - 1)} \end{aligned}$$

$$(5) \quad ab - 2a - b + 2$$

$$\begin{aligned} &= a(b - 2) - (b - 2) \\ &= \mathbf{(a - 1)(b - 2)} \end{aligned}$$

$$(6) \quad \frac{2}{5}x^2 - 0.8x - \frac{1}{2}$$

$$\begin{aligned} &= \frac{2}{5}x^2 - \frac{4}{5}x - \frac{1}{2} \\ &= \frac{4x^2 - 8x - 5}{10} \\ &= \frac{\mathbf{(2x + 1)(2x - 5)}}{10} \end{aligned}$$

$$(7) \quad a^4 - 8a^2 + 16$$

$$\begin{aligned} &= (a^2 - 4)^2 \\ &= \{(a + 2)(a - 2)\}^2 \\ &= \mathbf{(a + 2)^2(a - 2)^2} \end{aligned}$$

$$(8) \quad x^2 - 2xy + y^2 + x - y - 2$$

$$\begin{aligned} &= (x - y)^2 + (x - y) - 2 \\ &= A^2 + A - 2 \\ &= (A + 2)(A - 1) \\ &= \mathbf{(x - y + 2)(x - y - 1)} \end{aligned}$$

2. 次の式を因数分解せよ。(S級1分40秒, A級2分20秒, B級3分, C級4分30秒)

$$\begin{aligned}(1) \quad & 4x^2 + 36x - 40 \\ &= 4(x^2 + 9x - 10) \\ &= 4(\mathbf{x + 10})(\mathbf{x - 1})\end{aligned}$$

$$\begin{aligned}(2) \quad & -x^2 - 15xy - 50y^2 \\ &= -(x^2 + 15xy + 50y^2) \\ &= -(\mathbf{x + 5y})(\mathbf{x + 10y})\end{aligned}$$

$$\begin{aligned}(3) \quad & 36x^2 - 81y^2 \\ &= 9(4x^2 - 9y^2) \\ &= \mathbf{9(2x + 3y)(2x - 3y)}\end{aligned}$$

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

$$\begin{aligned}(5) \quad & ab - 3a - b + 3 \\ &= a(b - 3) - (b - 3) \\ &= (\mathbf{a - 1})(\mathbf{b - 3})\end{aligned}$$

$$\begin{aligned}(6) \quad & \frac{1}{2}x^2 - 0.8x - \frac{2}{5} \\ &= \frac{5x^2 - 8x - 4}{10} \\ &= \frac{(\mathbf{5x + 2})(\mathbf{x - 2})}{10}\end{aligned}$$

$$\begin{aligned}(7) \quad & a^4 - 18a^2 + 81 \\ &= (a^2 - 9)^2 \\ &= \{(a + 3)(a - 3)\}^2 \\ &= (\mathbf{a + 3})^2(\mathbf{a - 3})^2\end{aligned}$$

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