

反射テスト 文字式 因数分解 入試問題 04

1. 次の式を因数分解せよ。(S級1分30秒, A級2分, B級3分20秒, C級5分)

(1) $(7x - 9)^2 - (8x - 5)(5x - 2) - (2x + 3)(2x - 3)$

(2) $(a^2 - b^2)x^2 + (b^2 - a^2)y^2$

2. 次の式を因数分解せよ。(S級1分30秒, A級2分, B級3分20秒, C級5分)

(1) $(5x + 9y)^2 - (3x - y)(3x + 5y) - 2(5x + y)(x - 2y)$

(2) $(a^2 - 1)x^2 + y^2 - a^2y^2$

反射テスト 文字式 因数分解 入試問題 04 解答解説

1. 次の式を因数分解せよ。(S級1分30秒, A級2分, B級3分20秒, C級5分)

$$\begin{aligned}(1) \quad & (7x - 9)^2 - (8x - 5)(5x - 2) - (2x + 3)(2x - 3) \\ &= 49x^2 - 126x + 81 - (40x^2 - 16x - 25x + 10) - (4x^2 - 9) \\ &= 49x^2 - 126x + 81 - (40x^2 - 41x + 10) - (4x^2 - 9) \\ &= 49x^2 - 126x + 81 - 40x^2 + 41x - 10 - 4x^2 + 9 \\ &= 5x^2 - 85x + 80 \\ &= 5(x^2 - 17x + 16) \\ &= \mathbf{5(x - 1)(x - 16)}\end{aligned}$$

$$\begin{aligned}(2) \quad & (a^2 - b^2)x^2 + (b^2 - a^2)y^2 \\ &= (a^2 - b^2)x^2 - (a^2 - b^2)y^2 \quad \leftarrow \star \\ &= (a^2 - b^2)(x^2 - y^2) \\ &= \mathbf{(a + b)(a - b)(x + y)(x - y)}\end{aligned}$$

$$\star B - A = -(A - B)$$

2. 次の式を因数分解せよ。(S級1分30秒, A級2分, B級3分20秒, C級5分)

$$\begin{aligned}(1) \quad & (5x + 9y)^2 - (3x - y)(3x + 5y) - 2(5x + y)(x - 2y) \\ &= 25x^2 + 90xy + 81y^2 - (9x^2 + 15xy - 3xy - 5y^2) - 2(5x^2 - 10xy + xy - 2y^2) \\ &= 25x^2 + 90xy + 81y^2 - (9x^2 + 12xy - 5y^2) - 2(5x^2 - 9xy - 2y^2) \\ &= 25x^2 + 90xy + 81y^2 - 9x^2 - 12xy + 5y^2 - 10x^2 + 18xy + 4y^2 \\ &= 6x^2 + 96xy + 90y^2 \\ &= 6(x^2 + 16xy + 15y^2) \\ &= \mathbf{6(x + y)(x + 15y)}\end{aligned}$$

$$\begin{aligned}(2) \quad & (a^2 - 1)x^2 + y^2 - a^2y^2 \\ &= (a^2 - 1)x^2 + (1 - a^2)y^2 \\ &= (a^2 - 1)x^2 - (a^2 - 1)y^2 \quad \leftarrow \star \\ &= (a^2 - 1)(x^2 - y^2) \\ &= \mathbf{(a + 1)(a - 1)(x + y)(x - y)}\end{aligned}$$

$$\star B - A = -(A - B)$$