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・計算の順序を意識した展開の工夫

(例) 次の式を展開せよ。

$$\begin{aligned}(1) \quad (x+1)^2(x-1)^2 &= \{(x+1)(x-1)\}^2 \quad \leftarrow a^2b^2 = (ab)^2 \\ &= (x^2-1)^2 \\ &= x^4-2x^2+1_{//}\end{aligned}$$

$$\begin{aligned}(2) \quad (a^2+b^2)(\underline{a+b})(\underline{a-b}) &= (a^2+b^2)(\underline{a^2-b^2}) \\ &= a^4-b^4_{//}\end{aligned}$$

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

ここで、 $x^2+5x=x$ とおくと

$$\begin{aligned}(\text{与式}) &= (x+4)(x+6) \\ &= x^2+10x+24 \\ &= (x^2+5x)^2+10(x^2+5x)+24 \\ &= x^4+10x^3+25x^2+50x+24 \\ &= x^4+10x^3+35x^2+50x+24_{//}\end{aligned}$$

$$\begin{aligned}(4) \quad (a+2b)(a-2b)(a^2+2ab+4b^2)(a^2-2ab+4b^2) \\ &= \{(a+2b)(a^2-2ab+4b^2)\}\{(a-2b)(a^2+2ab+4b^2)\} \\ &= (a^3+8b^3)(a^3-8b^3) \\ &= a^6-64b^6_{//}\end{aligned}$$