

展開の公式 part I

Q 次の問題に答えて、知識をアウトプットしよう！！

問題 1

次の掛け算を展開公式を用いて楽に計算しよう

$$\begin{aligned}
 (1) 825 \times 775 \\
 &= (800 + 25) \times (800 - 25) \\
 &= 800^2 - 25^2 \\
 &= 640000 - (20 + 5)^2 \\
 &= 640000 - (400 + \frac{2 \times 20 \times 5}{200} + 25) \\
 &= 640000 - 425 \\
 &= 639375
 \end{aligned}$$

$$\begin{aligned}
 (2) 190^2 \\
 &= (200 - 10)^2 \\
 &= 200^2 - 2 \times 200 \times 10 + 10^2 \\
 &= 40000 - 4000 + 100 \\
 &= 36100
 \end{aligned}$$

問題 2

次の式を展開せよ

$$\begin{aligned}
 (1) 5a(b+c) \\
 &= 5ab + 5ac
 \end{aligned}$$

$$\begin{aligned}
 (2) \frac{1}{4}(8x+2) \\
 &= 2x + \frac{1}{2}
 \end{aligned}$$

$$\begin{aligned}
 (3) (x+a)^2 \\
 &= x^2 + 2ax + a^2
 \end{aligned}$$

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

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

$$\begin{aligned}
 (6) (3x - \frac{a}{2})^2 \\
 &= 9x^2 - 2 \times 3x \times \frac{a}{2} + (\frac{a}{2})^2 \\
 &= 9x^2 - 3ax + \frac{a^2}{4}
 \end{aligned}$$

$$\begin{aligned}
 (7) (x+b)(x-b) \\
 &= x^2 - b^2
 \end{aligned}$$

$$\begin{aligned}
 (8) (3+a)(-a+3) \\
 &= (3+a)(3-a) \\
 &= 9 - a^2
 \end{aligned}$$

$$\begin{aligned}
 (9) (2b+3)(4a+c) \\
 &= 8ab + 2bc + 12a + 3c
 \end{aligned}$$

$$\begin{aligned}
 (10) (2x+1)(x+3) \\
 &= 2x^2 + (2 \cdot 3 + 1)x + 3 \\
 &= 2x^2 + 7x + 3
 \end{aligned}$$

$$\begin{aligned}
 (11) (3x-y)(x+2y) \\
 &= 3x^2 + (3 \cdot 2 - 1)xy - 2y^2 \\
 &= 3x^2 + 5xy - 2y^2
 \end{aligned}$$

$$\begin{aligned}
 (12) (ab+2)(ab-4) \\
 &= (ab)^2 + (2-4)ab - 8 \\
 &= a^2b^2 - 2ab - 8
 \end{aligned}$$

$$\begin{aligned}
 (13) 2(2x+4)(2x+1) \\
 &= 2 \times \{4x^2 + (4+1) \times 2x + 4\} \\
 &= 2 \times (4x^2 + 10x + 4) = 8x^2 + 20x + 8
 \end{aligned}$$

$$\begin{aligned}
 (14) (x-2)(x+2)(x^2+4) \\
 &= (x^2-4)(x^2+4) \\
 &= x^4 - 16
 \end{aligned}$$

$$\begin{aligned}
 (15) (x-1)^2(2x+3) \\
 &= (x-1)(x-1)(2x+3) \\
 &= (x-1)(2x^2-x-3) \\
 &= 2x^3 - x^2 - 3x - 2x^2 + x + 3 \\
 &= 2x^3 - 3x^2 - 2x + 3
 \end{aligned}$$

$$\begin{aligned}
 &\begin{array}{c} \text{あけて あけて} \\ (0+\Delta)(x+\square) \\ \text{あけて あけて} \\ = 0x + 0\square + \\ \Delta x + \Delta\square \end{array}
 \end{aligned}$$

$$\begin{aligned}
 &\begin{array}{c} (0+\Delta)(x+\square+\square) \end{array}
 \end{aligned}$$