次の式を展開しなさい。

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

$$\underline{x^3+y^3}$$

(2) $(x^2+3x)(x^2+3x+5)$

$x^2+3x = A$ とすると

$A(A+5) = A^2+5A$

$= (x^2+3x)^2+5(x^2+3x)$

$= x^4+6x^3+9x^2+5x^2+15x$ → $\underline{x^4+6x^3+14x^2+15x}$

(3) $(x-2)(x+2)(x^2+4)$

$= (x^2-4)(x^2+4)$

$= x^4-16$

(4) $(x+2)^2(x-2)^2(x^2+4)^2$

$\{(x+2)(x-2)\}^2 (x^2+4)^2$

$= (x^2-4)^2(x^2+4)^2 = \{(x^2-4)(x^2+4)\}^2 = (x^4-16)^2$

$$= \underline{x^8-32x^4+256}$$

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

$= (x+2y)^2 - 6(x+2y) + 9$

$$= \underline{x^2+4xy+4y^2-6x-12y+9}$$

(6) $(x-3)^2(x+3)^2$

$= \{(x-3)(x+3)\}^2 = (x^2-9)^2$

$$= \underline{x^4-18x^2+81}$$