

Ex 1.9

$$4) \underbrace{(a+b)^2}_{A^2} - \underbrace{x^2}_{B^2} = [(a+b)+x][(a+b)-x] = (a+b+x)(a+b-x)$$
$$= [A+B][A-B]$$

avec  $A = a+b$   
 $B = x$

$$5) (ax+2y)^2 - (2x-3y)^2 = [(ax+2y)+(2x-3y)][(ax+2y)-(2x-3y)]$$

$$A = (ax+2y)$$
$$B = (2x-3y)$$

$$= (ax-y+2x)(ax+2y-2x+3y)$$
$$= (ax-y+2x)(ax+5y-2x)$$

Ex 1.9

$$\begin{aligned} 1) \quad \frac{u^4}{625} - \frac{v^4}{81} &= \left( \frac{u^2}{25} + \frac{v^2}{9} \right) \underbrace{\left( \frac{u^2}{25} - \frac{v^2}{9} \right)}_{A^2 - B^2} & A &= \frac{u}{5} \\ & & B &= \frac{v}{3} \\ &= \left( \frac{u^2}{25} + \frac{v^2}{9} \right) \underbrace{\left( \frac{u}{5} + \frac{v}{3} \right)}_{(A+B)} \underbrace{\left( \frac{u}{5} - \frac{v}{3} \right)}_{(A-B)} \end{aligned}$$

$$2) \quad x^2(a+b) + 2(a+b)x + (a+b)$$

$$= (a+b) \left[ x^2 + 2x + 1 \right]$$

$$= (a+b)(x+1)^2$$

$$19) (a+b)^2 - 2(a+b)c + c^2 \quad x = a+b$$

$$\left( x^2 - 2xc + c^2 = (x-c)^2 \right)$$

$$[(a+b) - c]^2 = (a+b-c)^2$$

$$12) x^5 y^4 - x = x \left( \underbrace{x^4 y^4}_{A^2} - \underbrace{1}_{B^2} \right) \quad \begin{array}{l} A = x^2 y^2 \\ B = 1 \end{array}$$

$$= x \left( x^2 y^2 + 1 \right) \left( \underbrace{x^2 y^2}_{C^2} - \underbrace{1}_{D^2} \right) \quad \begin{array}{l} C = xy \\ D = 1 \end{array}$$

$$= x \left( x^2 y^2 + 1 \right) \left( xy + 1 \right) \left( xy - 1 \right) \\ (C+D)(C-D)$$

$$17) \quad x^2 - x + \frac{1}{4} = \left(x - \frac{1}{2}\right)^2$$

$$A^2 - 2AB + B^2 = (A - B)^2$$

$$A = x$$

$$B = \frac{1}{2}$$

$$\text{verif: } 2 \cdot x \cdot \frac{1}{2} = \frac{2x}{2} = x \quad \checkmark$$

$$18) \quad \frac{xy}{3} + \frac{y^2}{9} + \frac{x^2}{4} = \left(\frac{y}{3} + \frac{x}{2}\right)^2$$

$2AB + A^2 + B^2$

$$(A^2 + 2AB + B^2 = (A + B)^2$$

$$A = \frac{y}{3}$$

$$B = \frac{x}{2}$$

$$\text{verif } 2 \cdot A \cdot B = 2 \cdot \frac{y}{3} \cdot \frac{x}{2} = \frac{2xy}{6} = \frac{xy}{3} \quad \checkmark$$