

$$1) x^3 - y^3 = x^3 + yx^2 + xy^2 - yx^2 - xy^2 - y^3 = x(x^2 + yx + y^2) - y(x^2 + xy + y^2) = (x^2 + yx + y^2)(x - y)$$

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

$$3) x^2 - 35x + 300 = x^2 - 15x - 20x + 300 = x(x - 15) - 20(x - 15) = (x - 15)(x - 20)$$

$$4) 2yz + x^2 - 2xy - 2xz + y^2 + z^2 = yz + yz - xy - xy - xz - xz + x^2 + y^2 + z^2 = x^2 - xy - xz + y^2 + yz - xy + z^2 + yz - xz = -x(-x + y + z) + y(y + z - x) + z(z + y - x) = (y + z - x)(-x + y + z) = (y + z - x)^2$$

$$5) x^3 + 3xy^2 - 3x^2y - y^3 = x^3 + xy^2 + xy^2 + xy^2 - x^2y - x^2y - x^2y - y^3 =$$

$$x^3 - x^2y - y^3 + xy^2 + xy^2 - x^2y + xy^2 - x^2y =$$

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

$$(x - y)(x(x - y) - y(-y + x)) = (x - y)(x - y)(x - y) = (x - y)^3$$

подсказка

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

$$a^2 - b^2 = (a + b)(a - b)$$

$$x^2 + 2xy + y^2 = x^2 + xy + xy + y^2 = x(x + y) + y(x + y) = (x + y)(x + y) = (x + y)^2$$

$$(xy)^2 = x^2y^2$$

$$a^2 + 2ab + b^2 = (a + b)^2$$

$$-b^2 + 2bc + a^2 - c^2 = -b^2 + bc + bc + a^2 - c^2 =$$

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

$$-1(b + c)(b + c) + a^2 = -1(b + c)^2 + a^2 =$$

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

$$= (a + b + c)(a - b - c)$$

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

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

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

$$ax + ay - bx - by = a(x + y) - b(x + y) = (x + y)(a - b)$$

$$15xa - 5xb - 21ya + 7yb = 5x(3a - b) - 7y(3a - b) = (3a - b)(5x - 7y)$$

$$25x^2 - 30xy + 9y^2 = (5x)^2 - 2 \cdot 5x \cdot 3y + (3y)^2 = (5x - 3y)^2$$

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

ИДЕИ

1. Идеи группировки
2. Растащить
3. Добавить - вычесть
4. Применение формул