

Сложение и вычитание:

$$1) (7a+8b-3)+(a-6b+10)= \\ = \underline{7a} + \underline{8b} - 3 + \underline{a} - \underline{6b} + 10 = 8a + 2b + 7;$$

$$2) (3x^2 - y^2 + 2) - (11x^2 + 2y^2 - 4) = \\ = \underline{3x^2} - \underline{y^2} + 2 - \underline{11x^2} - \underline{2y^2} + 4 = \\ = -8x^2 - 3y^2 + 6;$$

Многочлены**Умножение на одночлен:**

$$3) a(a^2 + 3) = a^3 + 3a;$$

$$4) -2(4a^3 - b) + 5(b - b^2) = \\ = -8a^3 + \underline{2b} + \underline{5b} - 5b^2 = -8a^3 + 7b - 5b^2;$$

$$5) x(4 - xy) - y(3 - 2x^2) = \\ = 4x - \underline{x^2y} - 3y + \underline{2x^2y} = 4x + x^2y - 3y;$$

Деление на одночлен:

$$6) (7m^2n^2 + 4mn^2) : (mn^2) = 7m + 4;$$

$$7) (8a^3b^2 - 5a^2b^3) : (8a^2b^2) = a - \frac{5}{8}b;$$

$$8) (9x^3 - 6x^2 + 3x) : (3x) = 3x^2 - 2x + 1;$$

Умножение многочленов:

$$9) (x+3)(x+2) = x^2 + \underline{2x} + \underline{3x} + 6 = x^2 + 5x + 6;$$

$$10) (a-5)(a^2+2a-5) = a^3 + \underline{2a^2} - \underline{5a} - \underline{5a^2} - \underline{10a} + 25 = \\ = a^3 - 3a^2 - 15a + 25;$$

$$11) (2-m)(4+2m+m^2) = 8 + \underline{4m} + \underline{2m^2} - \underline{4m} - \underline{2m^2} - m^3 = 8 - m^3;$$

Формулы сокращенного умножения (ФСУ):

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

$$12) (a-y)(a+y) = a^2 + \underline{ay} - \underline{ay} - y^2 = a^2 - y^2;$$

$$13) (n+3m)(n-3m) = n^2 - (3m)^2 = n^2 - 9m^2;$$

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

$$14) (x+2)^2 = (x+2)(x+2) = x^2 + \underline{2x} + \underline{2x} + 4 = x^2 + 4x + 4;$$

$$15) (3x-4y)^2 = (3x)^2 - 2 \cdot 3x \cdot 4y + (4y)^2 = 9x^2 - 24xy + 16y^2;$$

$$(a \pm b)^3 = a^3 \pm 3a^2b + 3ab^2 \pm b^3$$

$$16) (x+3)^3 = (x+3)(x+3)(x+3) = (x+3)(x^2 + 6x + 9) = \\ = x^3 + \underline{6x^2} + \underline{9x} + \underline{3x^2} + \underline{18x} + 27 = x^3 + 9x^2 + 27x + 27;$$

$$17) (2x-1)^3 = (2x)^3 - 3 \cdot (2x)^2 \cdot 1 + 3 \cdot (2x) \cdot 1^2 - 1^3 = 8x^3 - 12x^2 + 6x - 1;$$

$$(a \pm b)(a^2 \mp ab + b^2) = a^3 \pm b^3$$

$$18) (x-2)(x^2+2x+4) = x^3 + \underline{2x^2} + \underline{4x} - \underline{2x^2} - \underline{4x} - 8 = x^3 - 8;$$

$$19) (3a+1)(9a^2-3a+1) = (3a+1)((3a)^2 - 3a \cdot 1 + 1^2) = \\ = (3a)^3 + 1^3 = 27a^3 + 1.$$