

РАЦИОНАЛНИ АЛГЕБАРСКИ ИЗРАЗИ
(други део)

1. Упрости изразе:

1) $2x + 3x = 5x$

2) $2x \cdot 3x = 6x^2$

3) $-3x \cdot 2x^2y = -6x^3y$

4) $-2ab^3 \cdot 5a^3b = -10a^4b^4$

5) $(2a^2b^3)^4 = 2^4(a^2)^4(b^3)^4 = 16a^8b^{12}$

6) $4x + 5x = 9x$

7) $4x \cdot 5x = 20x^2$

8) $-5x^4y \cdot 3y = -15x^4y^2$

9) $-4a^4b^2 \cdot 7a^5b = -28a^9b^3$

10) $(3a^3b^2)^3 = 3^3(a^3)^3(b^2)^3 = 27a^9b^6$

$(x^a)^b = x^{a \cdot b}$

$x = x^1$

$x + x = 2x$
 $x \cdot x = x^2$

2. Упрости изразе:

1) $2 \cdot (x - 3) = 2x - 2 \cdot 3 = 2x - 6$

2) $-4 \cdot (x - 2) = -4x + 8$

3) $2x \cdot (x^2 + 5x - 3) = 2x \cdot x^2 + 2x \cdot 5x - 2x \cdot 3 = 2x^3 + 10x^2 - 6x$

4) $-3x^2 \cdot (x + 2) = -3x^3 - 6x^2$

5) $5x^4 \cdot (x^2 - 3x + 1) = 5x^6 - 15x^5 + 5x^4$

6) $(x - 3) \cdot (x - 2) = x^2 - 2x - 3x + 6 = x^2 - 5x + 6$

7) $(x + 4) \cdot (x - 2) = x^2 - 2x + 4x - 8 = x^2 + 2x - 8$

8) $(x - 3) \cdot (x + 5) = x^2 + 5x - 3x - 15 = x^2 + 2x - 15$

9) $(x + 3) \cdot (x + 2) = x^2 + 2x + 3x + 6 = x^2 + 5x + 6$

10) $(x - 4) \cdot (x - 1) = x^2 - x - 4x + 4 = x^2 - 5x + 4$

11) $(a - 3b^2) \cdot (4 - 5ab) = 4a - 5a^2b - 12b^2 + 15ab^3$

12) $(xy + 3) \cdot (x - y) = xy^2 - xy^2 + 3x - 3y$

$a \cdot (b + c) = a \cdot b + a \cdot c$

$(3x + 2) \cdot (x - 4) =$

 $= 3x \cdot x + 3x \cdot (-4) + 2 \cdot x + 2 \cdot (-4)$
 $= 3x^2 - 12x + 2x - 8$
 $= 3x^2 - 10x - 8$
 прво одређу знак!

"СВАКИ БРОЈ ИМА СВОЈ ЗНАК"

$$13) (a^2b-4) \cdot (a+b) = a^2b \cdot a - a^2b \cdot b - 4a - 4b = a^3b - a^2b^2 - 4a - 4b$$

$$14) (x+3y) \cdot (xy^3+2) = x \cdot xy^3 + x \cdot 2 + 3y \cdot xy^3 + 3y \cdot 2 = x^2y^3 + 2x + 3xy^4 + 6y$$

Упрости изразе:

$$1) a \cdot (a-1) - a \cdot (a-2) = a^2 - a - a^2 + 2a = a$$

$$2) 3x \cdot (x-1) - 2 \cdot (1+x^2) = 3x^2 - 3x - 2 - 2x^2 = x^2 - 3x - 2$$

$$3) (4x-3) \cdot (3x+4) - 6x \cdot (1+2x) = 12x^2 + 16x - 9x - 12 - 6x - 12x^2 = x - 12$$

$$4) 2a \cdot (3a^2 + 4a + 5) + (2a^2 - 1) \cdot (-3a) = 6a^3 + 8a^2 + 10a - 6a^3 + 3a = 8a^2 + 13a$$

$$5) (x-4) \cdot (x+3) = (x-2) \cdot (x+1) = (x^2 + 3x - 4x - 12) = (x^2 + x - 2x - 2) = x^2 + 3x - 4x - 12 - x^2 - x + 2x + 2 = -10$$

6) $(2x-1) \cdot (4x+3) = (1+2x) \cdot (4x-2)$
 ПРОИЗВОД ДВЕ ЗАГРАДЕ ИСПРЕД КОЈИХ ЈЕ ОБАВЕЗНО СТАВИ Ч ЗАГРАДУ
 $= 8x^2 + 6x - 4x - 3 - (4x - 2 + 8x^2 - 4x) = 8x^2 + 6x - 4x - 3 - 4x + 2 - 8x^2 + 4x = 2x - 1$

Упрости изразе:

$$1) (x-2) \cdot (x-5) - 2 \cdot (x-1) \cdot (x+4) = x^2 - 5x - 2x + 10 - 2 \cdot (x^2 + 4x - x - 4) = x^2 - 7x + 10 - 2x^2 - 8x + 2x + 8 = -x^2 - 13x + 18$$

ПРВО ПОМНОЖИ ЗАГРАДЕ

$$2) x \cdot (x-5) + x \cdot (7x-3) - 4 \cdot (2x-1) \cdot (x-3) = x^2 - 5x + 7x^2 - 3x - 4 \cdot (2x^2 - 6x - x + 3) = 8x^2 - 8x - 8x^2 + 24x + 4x - 12 = 20x - 12$$

$$3) (3x-7) \cdot (2x+1) - 2x \cdot (2x^2-1) - x \cdot (x+2) \cdot (5-4x) = 6x^2 + 3x - 14x - 7 - 4x^3 + 2x - x \cdot (5x - 4x^2 + 10 - 8x) = 6x^2 - 9x - 7 - 4x^3 - 5x^2 + 4x^3 - 10x + 8x^2 = 9x^2 - 19x - 7$$

$$4) (4x-7) \cdot (3x-5) - x \cdot (12x-11) \cdot (x-1) = 12x^2 - 20x - 21x + 35 - x \cdot (12x^2 - 12x - 11x + 11) = 12x^2 - 41x + 35 - 12x^3 + 12x^2 + 11x^2 - 11x = -12x^3 + 35x^2 - 52x + 35$$

$$5) 5(3x^2-2) + 3 \cdot (5x-1) \cdot (-x+2) = 15x^2 - 10 + 3 \cdot (-5x^2 + 10x + x - 2) = 15x^2 - 10 - 15x^2 + 30x + 3x - 6 = 33x - 16$$

5. Реши једначине:

1) $3x - 2 \cdot (4x - 5) = 0;$

$$3x - 8x + 10 = 0$$

$$-5x + 10 = 0$$

$$-5x = 0 - 10$$

$$-5x = -10$$

$$x = \frac{-10}{-5}$$

$$\boxed{x = 2}$$

3) $3 \cdot (2x - 1) + 4x = 17;$

$$6x - 3 + 4x = 17$$

$$10x - 3 = 17$$

$$10x = 17 + 3$$

$$10x = 20$$

$$x = \frac{20}{10}$$

$$\boxed{x = 2}$$

5) $6 \cdot (a + 1) - 3 \cdot (a + 2) = 1;$

$$6a + 6 - 3a - 6 = 1$$

$$3a = 1$$

$$\boxed{a = \frac{1}{3}}$$

2) $2 \cdot (x - 3) - 4 = 2;$

$$2x - 6 - 4 = 2$$

$$2x - 10 = 2$$

$$2x = 2 + 10$$

$$2x = 12$$

$$x = \frac{12}{2}$$

$$\boxed{x = 6}$$

4) $(x - 3) \cdot (x + 2) - x^2 = 0;$

$$\cancel{x^2} + 2x - 3x - 6 - \cancel{x^2} = 0$$

$$-x - 6 = 0$$

$$-x = 0 + 6$$

$$-x = 6$$

$$\boxed{x = -6}$$

6) $2 \cdot (z + 1) + 3 \cdot (z + 2) - 4 \cdot (z - 3) = 5;$

$$\underline{2z} + 2 + \underline{3z} + 6 - \underline{4z} + 12 = 5$$

$$z + 20 = 5$$

$$z = 5 - 20$$

$$\boxed{z = -15}$$

$$7) a^2 + 2a \cdot (a+3) - 3 \cdot (a+a^2) = 33;$$

$$\underline{a^2} + \underline{2a^2} + 6a - 3a - \underline{3a^2} = 33$$

$$3a = 33$$

$$a = \frac{33}{3}$$

$$\boxed{a = 11}$$

$$9) x \cdot (x+1) + x \cdot (x-2) - (2x-3) \cdot (x+4) = 6.$$

$$x^2 + x + x^2 - 2x - (2x^2 + 8x - 3x - 12) = 6$$

$$\underline{2x^2} - x - \underline{2x^2} - 8x + 3x + 12 = 6$$

$$-6x + 12 = 6$$

$$-6x = 6 - 12$$

$$-6x = -6$$

$$x = \frac{-6}{-6}$$

$$\boxed{x = 1}$$

$$8) (x-2) \cdot (x+3) - (x-5) \cdot (x+4) = 6;$$

$$x^2 + 3x - 2x - 6 - (x^2 + 4x - 5x - 20) = 6$$

$$\underline{x^2} + \underline{x} - 6 - \underline{x^2} - \underline{4x} + \underline{5x} + 20 = 6$$

$$2x + 14 = 6$$

$$2x = 6 - 14$$

$$2x = -8$$

$$x = \frac{-8}{2}$$

$$\boxed{x = -4}$$

$$10) (3x+5) \cdot (4x-9) - 4(x-1) \cdot (3x-4) = 2.$$

$$12x^2 - 27x + 20x - 45 - 4 \cdot (3x^2 - 4x - 3x + 4) = 2$$

$$\underline{12x^2} - \underline{7x} - \underline{45} - \underline{12x^2} + \underline{16x} + \underline{12x} - \underline{16} = 2$$

$$21x - 61 = 2$$

$$21x = 2 + 61$$

$$21x = 63$$

$$x = \frac{63}{21}$$

$$\boxed{x = 3}$$