

## РАСТАВЉАЊЕ ПОЛИНОМА НА ЧИНИОЦЕ

1. Растави на чиниоце:

$$1) 8x - 4 = 4(2x - 1)$$

$$2) 32x - 24y = 8(4x - 3y)$$

$$3) a^3 - a^2b = a^2(a - b)$$

$$4) 12a^4 + a^2 = a^2(12a^2 + 1)$$

$$5) 20a^7 - a = a(20a^6 - 1)$$

$$6) a^5bc^2 + a^3bc^4 = a^3bc^2(a^2 + c^2)$$

$$7) 12a^5b^2 + 8ab^2 = 4ab^2(3a^4 + 2)$$

$$8) 16x^4y^5 + 32x^4y^2 = 16x^4y^2(y^3 + 2)$$

$$9) -14x^5y^6 + 7x^4y^2 - 21x^3y^2 = 7x^3y^2(-2x^2y^4 + x - 3)$$

2. Растави на чиниоце:

$$1) 9a^2 - 12ab + 4b^2 = (3a - 2b)^2$$

$$2) 5x^2 - 50x + 125 = 5(x^2 - 10x + 25) = 5(x - 5)^2$$

$$3) 8y^2 + 8y + 2 = 2(4y^2 + 4y + 1) = 2(2y + 1)^2$$

$$4) 36a^2 - 12a + 1 = (6a - 1)^2$$

$$5) 36a^4 - 12a^3 + a^2 = a^2(36a^2 - 12a + 1) = a^2(6a - 1)^2$$

$$6) 12m^3n + m^2n^2 + 36m^4 = m^2(12mn + m^2 + 36m^2) = m^2(m^2 + 12mn + 36n^2) \\ = m^2 \cdot (m + 6n)^2$$

3. Растави на чиниоце:

$$1) x^2 - 36 = (x-6)(x+6)$$

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

$$3) 4x^2 - 9 = (2x-3)(2x+3)$$

$$4) 4a^2 - 25 = (2a-5)(2a+5)$$

$$5) 32a^6 - 8a^4 = 8a^4(4a^2 - 1) = 8a^4(2a-1)(2a+1)$$

$$6) \frac{1}{81} - x^2 = \left(\frac{1}{9} - x\right)\left(\frac{1}{9} + x\right)$$

$$7) 100y^3 - 9y = y(100y^2 - 9) = y(10y-3)(10y+3)$$

$$8) (x+1)^2 - 25 = ((x+1)-5)((x+1)+5) = (x+1-5)(x+1+5) = \\ = (x-4)(x+6)$$

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

$$10) 1 - (x+2)^2 = (1 - (x+2))(1 + (x+2)) = (1-x-2)(1+x+2) = \\ = (-1-x)(x+3)$$

4. Растави на чиниоце:

$$1) 20x^3 - 4x + 15x^2 - 3 = 4x(5x^2 - 1) + 3(5x^2 - 1) = (5x^2 - 1)(4x + 3)$$

$$2) 4a^3 + 36a - 2a^2 - 18 = 4a(a^2 + 9) - 2(a^2 + 9) = (a^2 + 9)(4a - 2) = \\ = (a^2 + 9) \cdot 2 \cdot (2a - 1)$$

$$3) 2ax^2 - x^2 + 8a - 4 = x^2(2a - 1) + 4(2a - 1) = (2a - 1)(x^2 + 4)$$

$$4) 5ax + 5ay - x - y = 5a(x+y) - (x+y) = (x+y)(5a-1)$$

$$5) \underbrace{2x^3 + 2x^2} + \underbrace{x+1} = 2x^2(x+1) + (x+1) = (x+1)(2x^2+1)$$

$$6) \underbrace{3a^2 - 3ab} + \underbrace{a-b} = 3a(a-b) + (a-b) = (a-b)(3a+1)$$

5. Скрати разломке:

$$1) \frac{x^3 + 4x^2}{2x + 8} = \frac{x^2(x+4)}{2(x+4)} = \frac{x^2}{2}$$

$$x \neq -4$$

$$2) \frac{x^2y + 2xy}{x+2} = \frac{xy(x+2)}{x+2} = xy$$

$$x \neq -2$$

$$3) \frac{y+y^2}{y^2-1} = \frac{y(1+y)}{(y-1)(y+1)} = \frac{y}{y-1}$$

$$y \neq 1, y \neq -1$$

$$4) \frac{a^3 - 9a}{a^2 + 6a + 9} = \frac{a(a^2 - 9)}{(a+3)^2} = \frac{a(a-3)(a+3)}{(a+3)(a+3)} = \frac{a(a-3)}{(a+3)}$$

$$x \neq -3$$

$$5) \frac{a^2}{a^2 + ab} = \frac{a^2}{a(a+b)} = \frac{a}{a+b}$$

$$x \neq 0$$

$$6) \frac{b^2 + 4b + 4}{2b + 4} = \frac{(b+2)^2}{2(b+2)} = \frac{(b+2)(b+2)}{2(b+2)} = \frac{b+2}{2}$$

$$b \neq -2$$

6. Реши једначине:

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

$$\sqrt{5x-1} = 0 \quad \text{или} \quad 3x-2 = 0$$

$$\sqrt{5x} = 1 \quad \quad \quad 3x = 0+2$$

$$\boxed{x = \frac{1}{5}}$$

$$3x = 2$$

$$\boxed{x = \frac{2}{3}}$$

$$x \in \left\{ \frac{1}{5}, \frac{2}{3} \right\}$$

$$2) \left( 5x - \frac{3}{10} \right) \cdot (2x-1) = 0$$

$$\sqrt{5x - \frac{3}{10}} = 0$$

$$\sqrt{5x} = 0 + \frac{3}{10}$$

$$\sqrt{5x} = \frac{3}{10}$$

$$x = \frac{\left(\frac{3}{10}\right)^2}{5}$$

$$\boxed{x = \frac{3}{50}}$$

$$2x-1 = 0$$

$$2x = 0+1$$

$$2x = 1$$

$$\boxed{x = \frac{1}{2}}$$

$$x \in \left\{ \frac{3}{50}, \frac{1}{2} \right\}$$

$$3) 6x^2 - 2x = 0$$

$$x(6x - 2) = 0$$

$$\boxed{x=0}$$

или

$$6x - 2 = 0$$

$$6x = 0 + 2$$

$$6x = 2$$

$$x = \frac{2}{6}$$

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

$$x \in \{0, \frac{1}{3}\}$$

$$4) x^2 - \frac{3}{5}x = 0$$

$$x(x - \frac{3}{5}) = 0$$

$$\boxed{x=0}$$

или  $x - \frac{3}{5} = 0$

$$x = 0 + \frac{3}{5}$$

$$\boxed{x = \frac{3}{5}}$$

$$x \in \{0, \frac{3}{5}\}$$

$$5) \sqrt{2}x^2 - 2x = 0$$

$$x(\sqrt{2}x - 2) = 0$$

$$\boxed{x=0}$$

или  $\sqrt{2}x - 2 = 0$

$$\sqrt{2}x = 2$$

$$x = \frac{2}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}}$$

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

$$\boxed{x = \sqrt{2}}$$

$$x \in \{0, \sqrt{2}\}$$

$$6) 9 - x^2 = 0$$

$$x^2 = 9$$

$$\boxed{x=3}$$

или  $\boxed{x=-3}$

$$x \in \{-3, 3\}$$

$$7) 4x^2 - 121 = 0$$

$$4x^2 = 0 + 121$$

$$4x^2 = 121$$

$$x^2 = \frac{121}{4}$$

$$x = \sqrt{\frac{121}{4}} \text{ или } x = -\sqrt{\frac{121}{4}}$$

$$x = \frac{11}{2} \text{ или } x = -\frac{11}{2}$$

$$8) 4x^2 - 12x + 9 = 0$$

$$(2x - 3)^2 = 0$$

$$(2x - 3)(2x - 3) = 0$$

$$2x - 3 = 0$$

$$2x = 0 + 3$$

$$2x = 3$$

$$\boxed{x = \frac{3}{2}}$$

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$$(2x - 11)(2x + 11) = 0$$

$$2x - 11 = 0 \quad 2x + 11 = 0$$

$$2x = 11$$

$$2x = 0 - 11$$

$$x = \frac{11}{2}$$

$$2x = -11$$

$$x = -\frac{11}{2}$$