

Разбиение отдельных членов на слагаемые

(как буквенных, так и числовых)

$$1) x^3 + 1991x + 1992 = 0$$

$$x^3 + 1992x - x + 1992 = 0$$

$$x(x^2 - 1) + 1992(x + 1) = 0$$

$$x(x - 1)(x + 1) + 1992(x + 1) = 0$$

$$(x + 1)(x(x - 1) + 1992) = 0$$

$$(x + 1)(x^2 - x + 1992) = 0$$

$$x_1 = -1$$

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

$$x^3 - 2x^2 - x^2 + 2 = 0$$

$$x^2(x - 1) - 2(x^2 - 1) = 0$$

$$x^2(x - 1) - 2(x - 1)(x + 1) = 0$$

$$(x - 1)(x^2 - 2x - 2) = 0$$

$$x_1 = 1$$

$$D = 1 + 2 = 3$$

$$x_2 = 1 - \sqrt{3}$$

$$x_3 = 1 + \sqrt{3}$$

$$3) x^4 - x^3 - 13x^2 + x + 12 = 0$$

$$4) x^3 + 4x^2 - 5 = 0$$

$$5) x^4 - x^3 - 7x^2 + x + 6 = 0$$

$$x^4 - x^3 - 6x^2 - x^2 + x + 6 = 0$$

$$x(x^3 - x^2 - x + 1) - 6(x^2 - 1) = 0$$

$$x(-x^2 - x + (x + 1)(x^2 - x + 1)) - 6(x^2 - 1) = 0$$

$$x(-x^2 - x + (x + 1)(x^2 - x + 1)) - 6(x + 1)(x - 1) = 0$$

$$x(-x(x + 1) + (x + 1)(x^2 - x + 1)) - 6(x + 1)(x - 1) = 0$$

$$x(x + 1)(x - 1)^2 - 6(x + 1)(x - 1) = 0$$

$$(x + 1)(x - 1)(x(x - 1) - 6) = 0$$

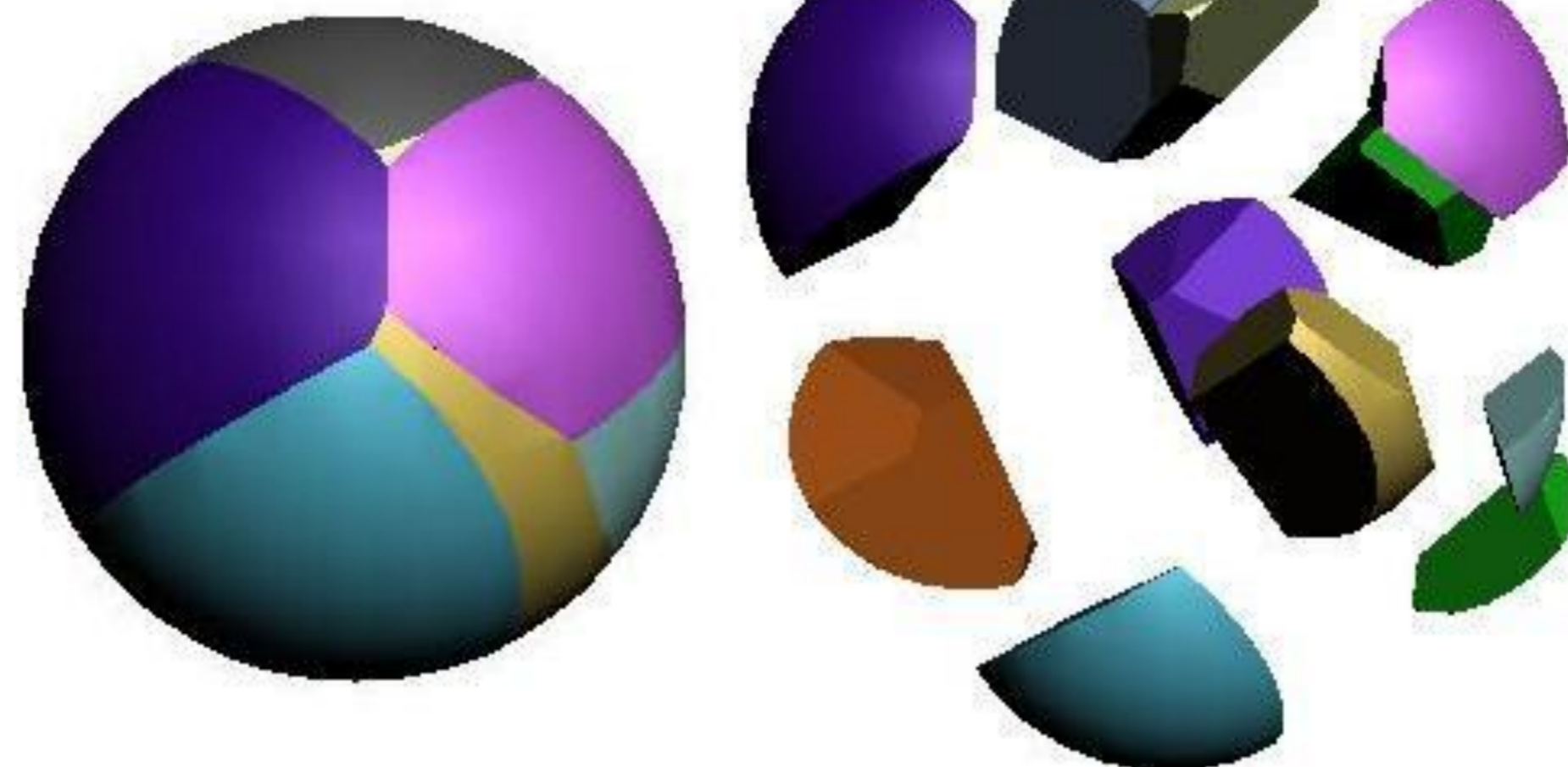
$$(x + 1)(x - 1)(x^2 - x - 6) = 0$$

$$x_1 = -1$$

$$x_2 = 1$$

$$x_3 = 3$$

$$x_4 = -2$$



$$3) x^4 - x^3 - 13x^2 + x + 12 = 0$$

$$x^3(x - 1) - 12x^2 - x^2 + x + 12 = 0$$

$$x^3(x - 1) - 12(x^2 - 1) - x(x - 1) = 0$$

$$x^3(x - 1) - 12(x - 1)(x + 1) - x(x - 1) = 0$$

$$(x - 1)(x^3 - 12x - 12 - x) = 0$$

$$(x - 1)(x^3 - 13x - 12) = 0$$

$$x_1 = 1$$

$$x^3 - 13x - 12 = 0$$

$$x^3 - 12x - x - 12 = 0$$

$$x(x^2 - 1) - 12(x + 1) = 0$$

$$x(x - 1)(x + 1) - 12(x + 1) = 0$$

$$(x + 1)(x^2 - x - 12) = 0$$

$$x_2 = -1$$

$$x^2 - x - 12 = 0$$

$$x_3 = 4$$

$$x_4 = -3$$

Ответ: 1; -1; 4; -3.

$$x^3 + 4x^2 - 5 = 0$$

$$x^3 + 5x^2 - x^2 - 5 = 0$$

$$x^2(x - 1) + 5(x^2 - 1) = 0$$

$$x^2(x - 1) + 5(x - 1)(x + 1) = 0$$

$$(x - 1)(x^2 + 5x + 5) = 0$$

$$x_1 = 1$$

$$x^2 + 5x + 5 = 0$$

$$D = 25 - 20 = 5$$

$$x_2 = \frac{-5 + \sqrt{5}}{2}$$

$$x_3 = \frac{-5 - \sqrt{5}}{2}$$

Ответ: 1; $\frac{-5 + \sqrt{5}}{2}$; $\frac{-5 - \sqrt{5}}{2}$.