

Группировка

$$1) x^3 + x^2 - 4x - 4 = 0$$

$$x^2(x+1) - 4(x+1) = 0$$

$$(x+1)(x^2 - 4) = 0$$

$$x_1 = -1$$

$$x_2 = 2$$

$$x_3 = -2$$

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

$$3(x^3 + 1) + 5x(x+1) = 0$$

$$3(x+1)(x^2 - x + 1) + 5x(x+1) = 0$$

$$(x+1)(3x^2 - 3x + 3 + 5x) = 0$$

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

$$x_1 = -1$$

$$x_2 = \text{нету}$$

$$D = -32$$

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

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

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

$$x_1 = 1$$

$$x_2 = -2$$

$$4) x^3 - x^2 - 81x + 81 = 0$$

$$x^2(x-1) - 81(x-1) = 0$$

$$(x-1)(x^2 - 81) = 0$$

$$x_1 = 1$$

$$x_2 = 9$$

$$x_3 = -9$$

$$5) x^3 + 3x^2 - 16x - 48 = 0$$

$$x^2(x+3) - 16(x+3) = 0$$

$$(x+3)(x^2 - 16) = 0$$

$$x_1 = -3$$

$$x_2 = 4$$

$$x_3 = -4$$

$$6) 2x^4 + 3x^3 + 16x + 24 = 0$$

$$x^3(2x+3) + 8(x+3) = 0$$

$$(2x+3)(x^3 + 8) = 0$$

$$x_1 = -3/2$$

$$x_2 = -2$$

$$7) 24x^4 + 16x^3 - 3x - 2 = 0$$

$$8x^3(3x+2) - 1(3x+2) = 0$$

$$(3x+2)(8x^3 - 1) = 0$$

$$x_1 = -2/3$$

$$x^3 = 1/8$$

$$x_2 = 1/2$$



$$8) x^3 + 5x^2 + 15x + 27 = 0$$

$$(x+3)(x^2 - 3x + 9) + 5x(x+3) = 0$$

$$(x+3)(x^2 + 2x + 9) = 0$$

$$x_1 = -3$$

$$x_2 = \text{нету}$$

$$9) 8x^3 - 6x^2 + 3x - 1 = 0$$

$$(2x-1)(4x^2 + 2x + 1) - 3x(2x-1) = 0$$

$$(2x-1)(4x^2 - x + 1) = 0$$

$$x_1 = 1/2$$

$$x_2 = \text{нету}$$