

линейные
уравнения

$$\textcircled{1} x + 1 = 0$$

$$x = -1$$

$$\textcircled{2} 4x + 2 = 0$$

$$4x = -2$$

$$x = -\frac{2}{4} = -\frac{1}{2}$$

квадратные
уравнения

$$\textcircled{1} x^2 + 2x + 4 = 0$$

$$D = \dots$$

$$x = \dots$$

$$\textcircled{2} (x+2)(x+4) = 0$$

$$x+2 = 0$$

$$x = -2$$

$$x+4 = 0$$

$$x = -4$$

Бикватратные
ур-ие

$$x^4 + 2x^2 + 8 = 0$$

$$x^2 = t \text{ (замена)}$$

$$t^2 + 2t + 8 = 0$$

$$D = \dots$$

$$x^4 - 10x^3 + 35x^2 - 50x + 24 = 0$$



$$X = \pm 1; X = \pm 2; X = \pm 3; X = \pm 4; \cancel{X = \pm 6}; \cancel{X = \pm 8};$$

$$X = 1; X = 2; X = 3; X = 4 \quad \cancel{X = \pm 12}; \cancel{X = \pm 24}$$

	1	-10	35	-50	24
$X=1$	1	$1 \cdot 1 - 10$	$1 \cdot (-9) + 35$	$26 - 50$	$1 \cdot (-24) + 24 = 0$
		"	$+35$	"	
		1 - 10	"	-24	
		"	$-9 + 35$	"	
		-9	"	26	

Arrows with asterisks (*) indicate the synthetic division process: from the constant term (1) to the coefficient of x^3 (-10), from the result (-9) to the coefficient of x^2 (35), and from the result (26) to the coefficient of x (-50).

$$x^4 - 10x^3 + 35x^2 - 50x + 24 =$$

$$= (x-1)(1x^3 - 9x^2 + 26x - 24)$$

	1	-9	26	-24
$X=4$	1	4 · 1 - 9	-20 + + 26	24 - - 24 = 0
		n		
		-5	6	

*
 *
 x

$$(x-1)(x-4)(x^2-5x+6) = 0$$



$$\Delta = 25 - 4 \cdot 1 \cdot 6 = 25 - 24 = 1$$

$$\left. \begin{array}{l} x = \frac{5+1}{2} = \frac{6}{2} = 3 \\ x = \frac{5-1}{2} = \frac{4}{2} = 2 \end{array} \right\} (x-3)(x-2)$$

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

$$\begin{array}{cccc} x-1=0 & x-4=0 & x-3=0 & x-2=0 \\ x=1 & x=4 & x=3 & x=2 \end{array}$$

Тема Многочлены.

Вспомнить схему Горнера, деление многочлена на многочлен

2. Решите уравнение $x^3 - 11x^2 + 24x + 36 = 0$.

$\pm 1; \pm 2; \pm 3; \pm 4; \pm 6; \pm 9; \pm 12; \pm 18; \pm 36$

	1	-11	24	36
-1	1	-1 · 1 + (-11) = -12	12 + 24 = 36	0

* $\sqrt{D} = 0$
 $D = 0$
 $x = \frac{-b \pm \sqrt{D}}{2a}$

$D = b^2 - 4ac = 144 - 144 = 0$
 $x_{1,2} = \frac{12}{2} = 6$

$$x^3 - 11x^2 + 24x + 36 = (x+1)(x^2 - 12x + 36) = 0$$

$$(x+1)(x-6) = 0 \Rightarrow \begin{cases} x = -1 \\ x = 6 \end{cases}$$

1. Вычислите:

а) $\sqrt[5]{1024 \cdot \frac{1}{243}}$;

в) $\sqrt[6]{12 - 4\sqrt{5}} \cdot \sqrt[6]{12 + 4\sqrt{5}}$;

б) $\sqrt[6]{\frac{8}{0,125}}$;

г) $\left(-\frac{1}{3}\sqrt[6]{18}\right)^6$.

$$\begin{aligned} \text{а) } \sqrt[5]{1024 \cdot \frac{1}{243}} &= \\ &= \sqrt[5]{\frac{1024}{243}} = \\ &= \frac{4}{3} \end{aligned}$$

$$\begin{aligned} \text{б) } \sqrt[6]{\frac{8}{0,125}} &= \\ &= \sqrt[6]{64} = 2 \end{aligned}$$

$$\text{в) } \sqrt[6]{12 - 4\sqrt{5}} \cdot \sqrt[6]{12 + 4\sqrt{5}} =$$

$$\begin{aligned} &= \sqrt[6]{(12 - 4\sqrt{5}) \cdot (12 + 4\sqrt{5})} = \sqrt[6]{144 - 80} = \sqrt[6]{64} = \\ &= 2 \end{aligned}$$

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

$$\begin{aligned} \text{г) } \left(-\frac{1}{3} \cdot \sqrt[6]{18}\right)^6 &= \\ &= \left(-\frac{1}{3}\right)^6 \cdot \left(\sqrt[6]{18}\right)^6 = \\ &= \frac{1}{729} \cdot 18 = \frac{18}{729} \end{aligned}$$

2. Упростите выражение, считая, что переменные принимают только положительные значения:

а) $\sqrt[5]{\frac{5m^8}{n^7}} : \sqrt[5]{\frac{160n^8}{m^{12}}}$; б) $\sqrt[3]{x^{-2}} \cdot \sqrt[4]{x^3} : \sqrt[6]{\sqrt{x^{25}}}$.

$$\text{а) } \sqrt[5]{\frac{5m^8}{n^7} : \frac{160n^8}{m^{12}}} = \sqrt[5]{\frac{5m^8}{n^7} \cdot \frac{m^{12}}{160n^8}} = \sqrt[5]{\frac{5m^8 \cdot m^{12}}{n^7 \cdot 160n^8}} =$$

$$= \sqrt[5]{\frac{5m^{20}}{160n^{15}}} = \sqrt[5]{\frac{5}{160}} \cdot \sqrt[5]{\frac{m^{20}}{n^{15}}} =$$

$$= \sqrt[5]{\frac{1}{32}} \cdot \frac{m^4}{n^3} = \frac{1m^4}{2n^3}$$

1. Вычислите:

а) $361^{-\frac{1}{2}} \cdot (216^{\frac{1}{3}} + 343^{\frac{2}{3}} - 125^{1\frac{1}{3}});$

б) $\frac{27^{0,7}}{(9^{0,6} \cdot 81^{-\frac{1}{4}})^{0,5}}.$

2. Упростите выражение:

а) $(64a^{-9})^{-\frac{2}{3}};$ б) $\frac{(a^{2,5} \cdot a^{-\frac{1}{6}})^{\frac{1}{3}}}{a^{-1\frac{2}{9}}}.$

$$y = x^2 - 6|x| + 5$$



$$y = x^2 - 6x + 5$$

$$x > 0$$

$$y = x^2 + 6x + 5$$

$$x < 0$$

$$x^2 - 6 \cdot |x|$$



$$-|x|$$

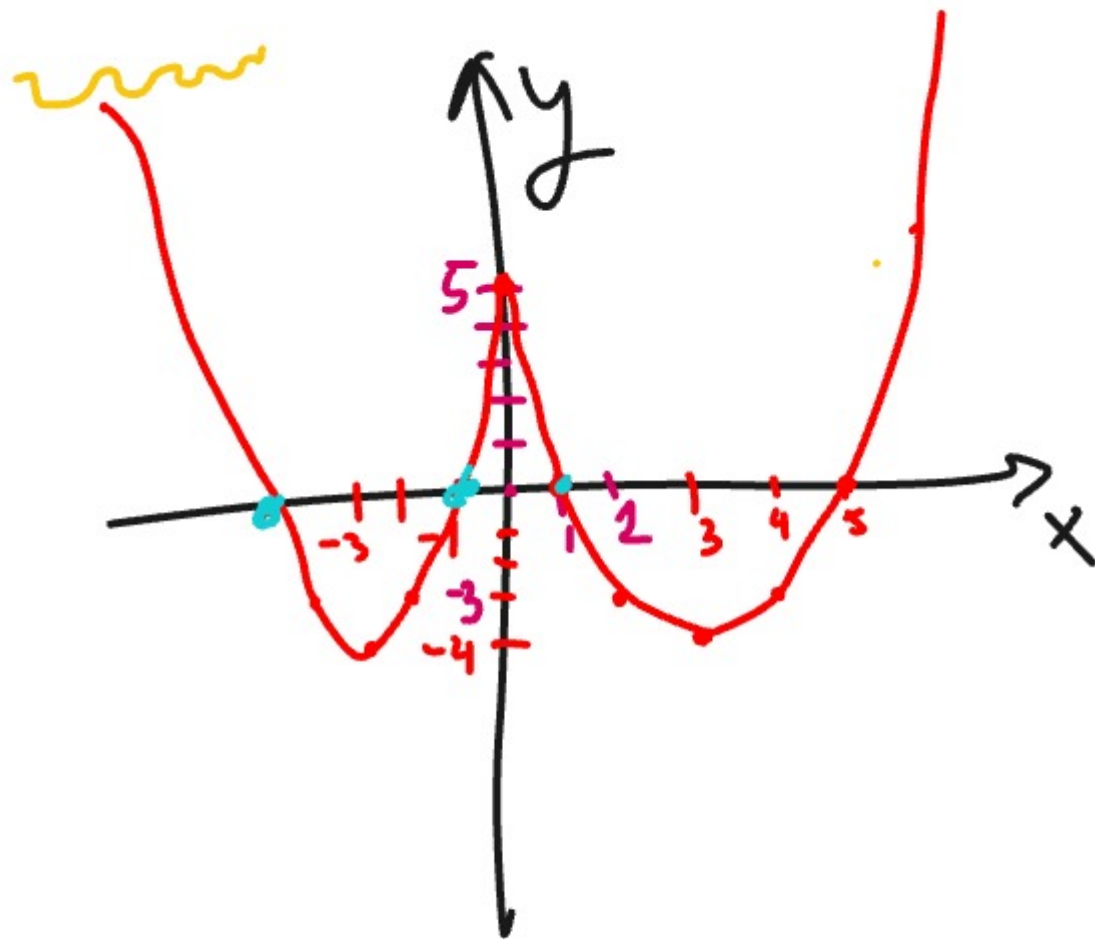
$$+|x|$$

$$-x$$

$$+x$$

$$y = x^2 - 6x + 5$$

x	1	0	1
y	0	5	-3



$$x_0 = \frac{-b}{2a}$$

$$x_0 = \frac{6}{2} = 3$$

$$y_0 = x^2 - 6x + 5 = 9 - 18 + 5$$

$$\sqrt{x^2+2x+3} = x^2+2x+1 \quad | \uparrow^2$$

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

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

$$x^2+2x = t$$

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

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

$$t+3 - t^2 - 2t - 1 = 0$$

$$-t^2 - t + 2 = 0 \quad | \cdot (-1)$$

$$t^2 + t - 2 = 0$$

$$\Delta = 1 - 4 \cdot (-2) = 1 + 8 = 9$$

$$t = \frac{-1+3}{2} = 1$$

$$t = \frac{-1-3}{2} = -2$$

$$X^2 + 2X = t$$

$$t = -5$$

$$X = -1 \pm \sqrt{5}$$

отбел

$$t = 4$$

$$\begin{aligned} \sqrt{20} &= \\ &= \sqrt{4 \cdot 5} = \\ &= 2\sqrt{5} \end{aligned}$$

$$X^2 + 2X = -5$$

$$X^2 + 2X + 5 = 0$$

$$D = 4 - 4 \cdot 5 = 4 - 20 = -16$$

$D < 0 \Rightarrow$ корней нет

$$X^2 + 2X = 4$$

$$X^2 + 2X - 4 = 0$$

$$D = 4 - 4 \cdot (-4) = 4 + 16 = 20$$

$$\begin{aligned} X &= \frac{-2 \pm \sqrt{20}}{2} = \\ &= \frac{-2 \pm 2\sqrt{5}}{2} = \frac{-1 \pm \sqrt{5}}{1} \end{aligned}$$

093:

$$x^2 + 2x + 3 \geq 0 \quad | \quad x^2 + 2x + 3 = 0$$

$$D = 4 - 4 \cdot 1 \cdot 3 =$$

$$= 4 - 12 < 0$$

$$D < 0$$

∴
корней
нет