

Математик а

Тема: Понятие корня n – й степени из действительного числа

Знать, уметь: «3» - иметь представление что такое степень с рациональным показателем, радикал; какая функция является степенной, ее график, свойства; знать основные тождества, корня n – й степени.

«4» - понимать что такое такое степень с рациональным показателем, радикал; какая функция является степенной, ее график, свойства; знать основные тождества, корня n – й степени.

«5» - активно оперировать понятиями радикал, степень с рациональным показателем; ; какая функция является степенной, ее график, свойства; знать основные тождества, корня n – й степени.

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

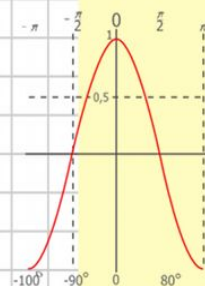
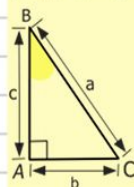
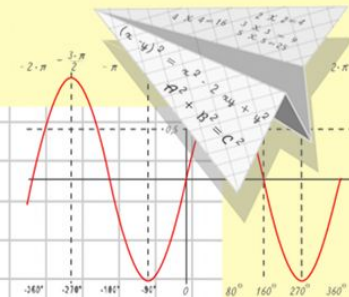
$$\sin 90^\circ = 1$$

$$x = 25y + 45$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

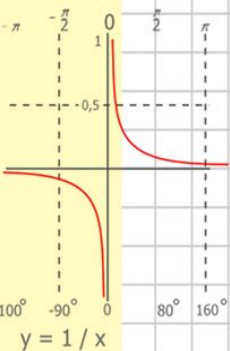
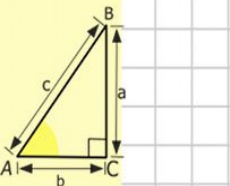
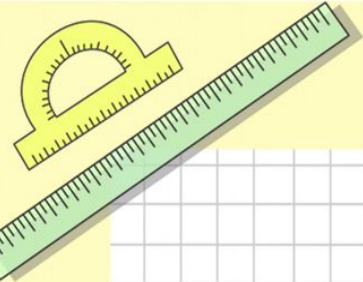
$$x = 70$$

$$(x+y)(x-y) = x^2 - y^2$$

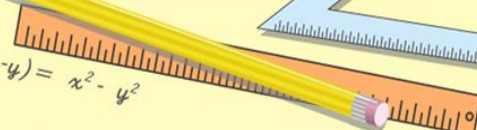
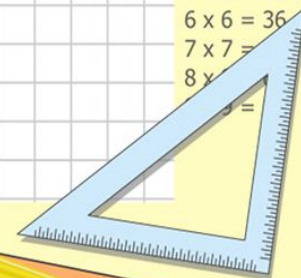


$$y = \cos x$$

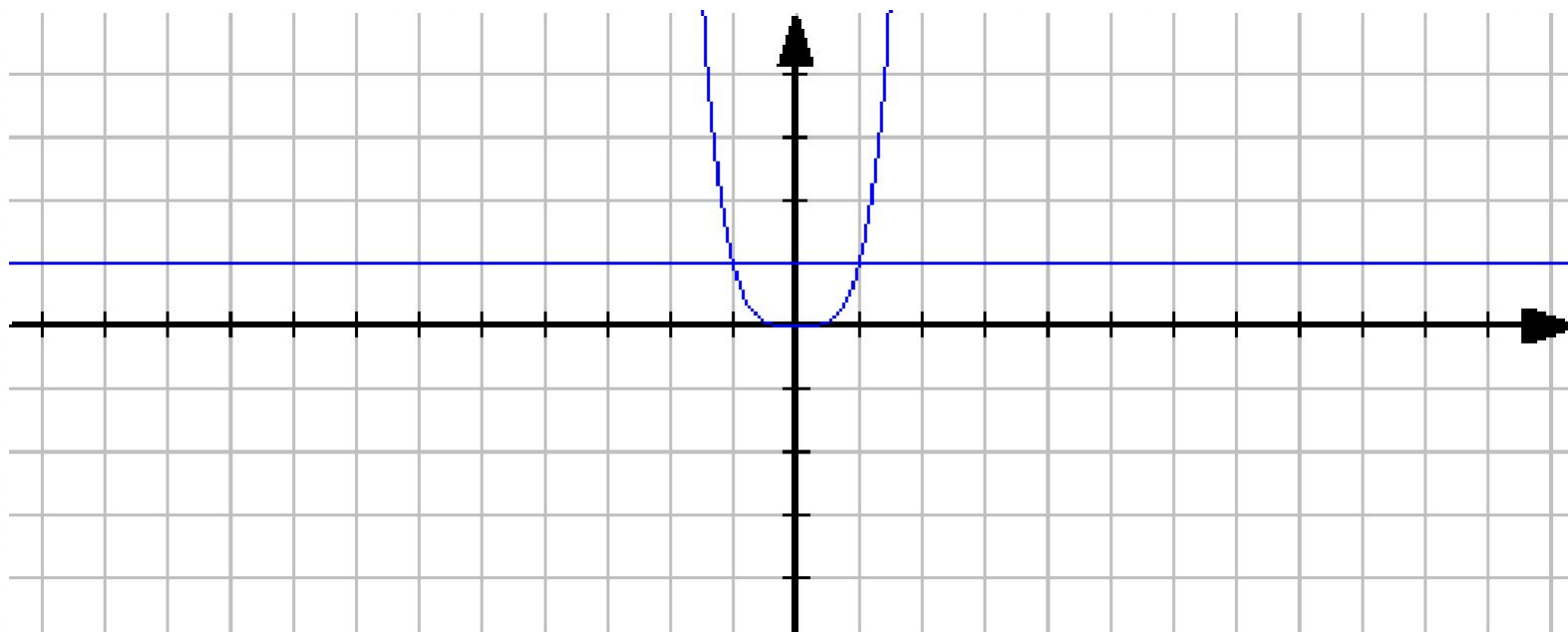
$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \end{aligned}$$



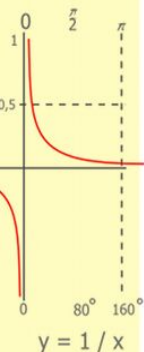
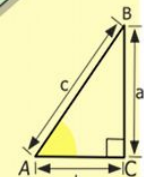
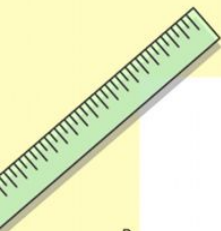
$$\begin{array}{r} 12500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$



Проблема. Решите уравнение $x^4 = 1$ графически.



графики пересекаются в точках $(-1; 1)$ и $(1; 1)$. Очевидно, что уравнение имеет два корня -1 и 1 .



$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

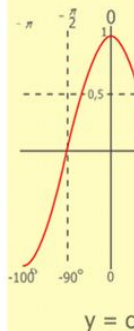
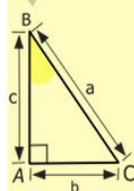
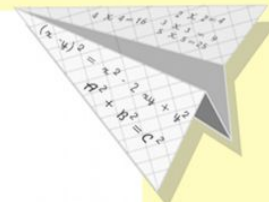
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

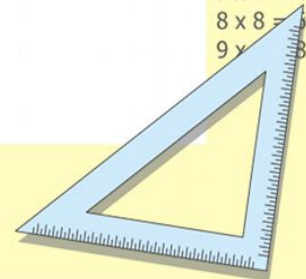


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \\ y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

$$(x+y)(x-y) = x^2 - y^2$$



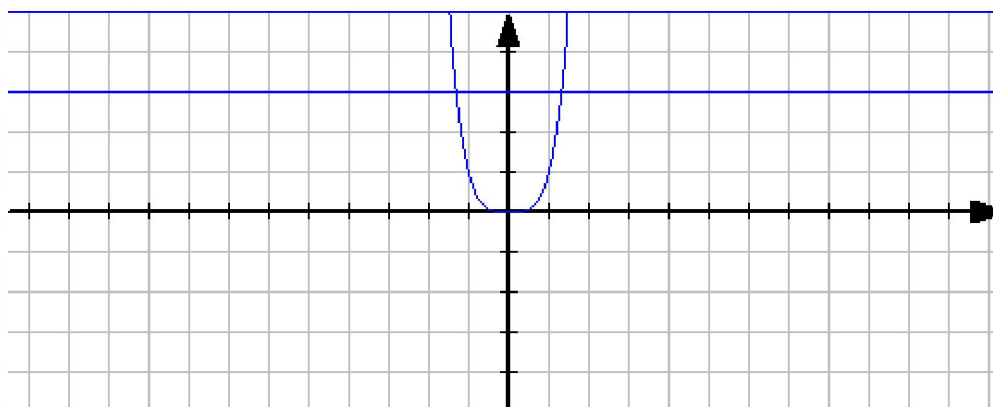
$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



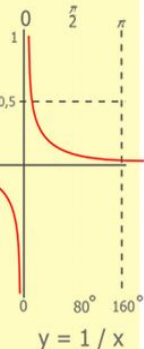
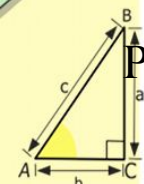
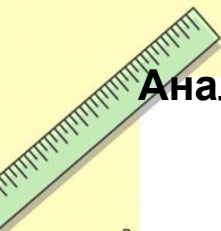
Аналогично, что уравнение $x^4 = 4$ имеет два корня -2 и 2.

Решить уравнение

$$x^4 = 3$$



$$x = -\sqrt[4]{3}, x = \sqrt[4]{3}$$



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 2100 \\ + 840 \\ \hline 10500 \end{array}$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

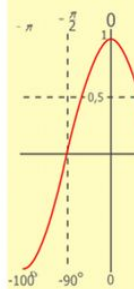
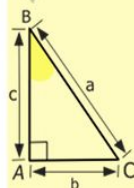
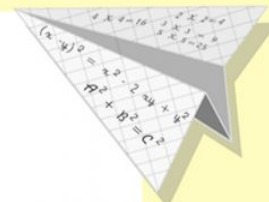


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

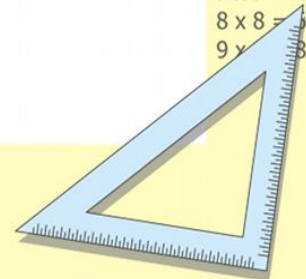
$$x = 70$$

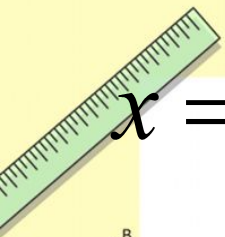
$$(x+y)(x-y) = x^2 - y^2$$



$$y = \cos$$

$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$

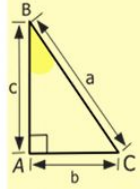
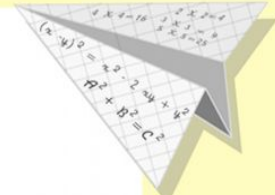




$$x = \pm \sqrt[n]{a}$$

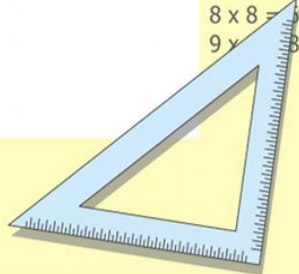
$$x = \sqrt[n]{a}$$

Решить уравнение $x^n = a$;



$y = \cos$

- $2 \times 2 = 4$
- $3 \times 3 = 9$
- $4 \times 4 = 16$
- $5 \times 5 = 25$
- $6 \times 6 = 36$
- $7 \times 7 = 49$
- $8 \times 8 = 64$
- $9 \times 9 = 81$



Корнем n – й степени из неотрицательного числа a называют такое неотрицательное число, которое при возведении в степень n дает в результате число a .

Число обозначают

$$\sqrt[n]{a}$$

$$\sqrt{49} = 7; \sqrt[3]{0,125} = 0,5; \sqrt[7]{0} = 0; \sqrt[4]{17} \approx 2$$

где n – показатель корня, a – подкоренное число.



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 840 \\ \hline 10500 \end{array}$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

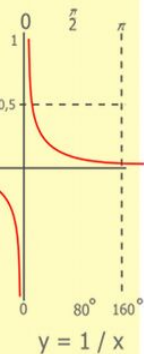
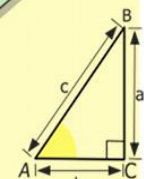
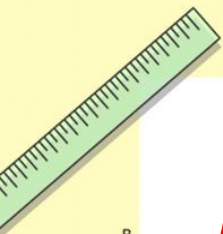


$$\begin{cases} y = \sin 90^\circ \\ x = 25y + 45 \\ y = 1 \\ x = 25 + 45 \\ x = 70 \end{cases}$$

$$(x+y)(x-y) = x^2 - y^2$$

Корнем нечетной степени из отрицательного числа а называют такое отрицательное число, которое будучи возведено в степень n, дает число а.

$$\sqrt[3]{-27} = -3; \sqrt[5]{-32} = -2$$



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

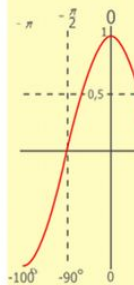
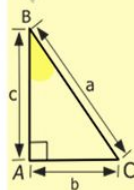
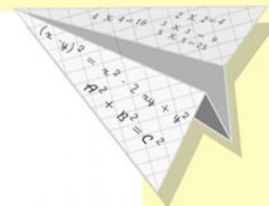


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

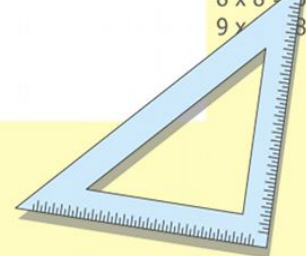
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

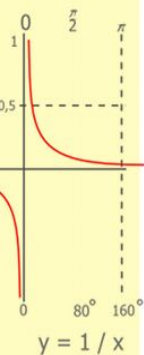
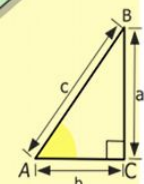
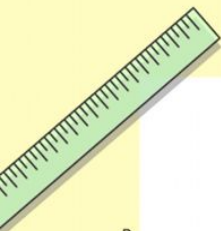
$$x = 70$$

$$(x+y)(x-y) = x^2 - y^2$$



$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$





$$\begin{array}{r} 1\ 2\ 5\ 00 \\ \times 4\ 2 \\ \hline 21\ 0 \\ + 84 \\ \hline 105\ 0\ 00 \end{array}$$



$$\sqrt[4]{16}$$

$$\sqrt[5]{32}$$

$$\sqrt[4]{81}$$

$$\sqrt[3]{64}$$

$$\sqrt[4]{\frac{16}{625}}$$

$$\sqrt[3]{0,125}$$

$$\sqrt[4]{5\frac{1}{16}}$$

$$\sqrt[3]{3\frac{3}{8}}$$

$$\sqrt[7]{-128}$$

$$\sqrt[3]{-\frac{1}{8}}$$

$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$

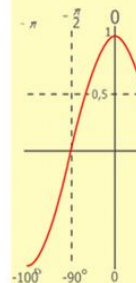
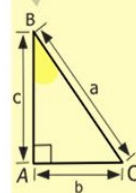
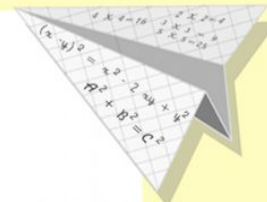


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

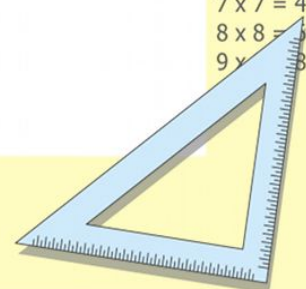
$$\frac{x}{70}$$

$$(x+y)(x-y) = x^2 - y^2$$



$$y = \cos$$

$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



$$\sqrt[4]{16} = 2$$

$$\sqrt[5]{32} = 2$$

$$\sqrt[4]{81} = 3$$

$$\sqrt[3]{64} = 4$$

$$\sqrt[4]{\frac{16}{625}} = \frac{2}{5}$$

$$\sqrt[3]{0,125} = 0,5$$

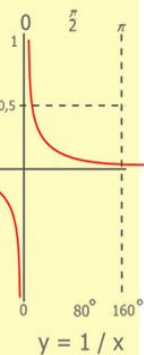
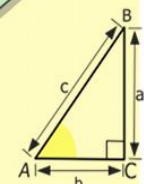
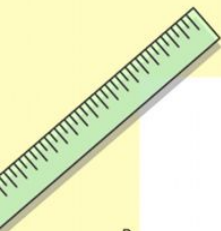
$$\sqrt[4]{5\frac{1}{16}} = \frac{3}{2} = 1\frac{1}{2}$$

$$\sqrt[3]{3\frac{3}{8}} = \frac{3}{2} = 1\frac{1}{2}$$

$$\sqrt[7]{-128} = -2$$

$$\sqrt[3]{-\frac{1}{8}} = -\frac{1}{2}$$

№1072, 1073,



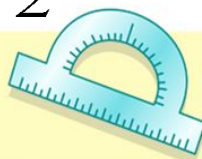
$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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$$\sin 90^\circ = 1$$

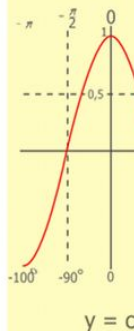
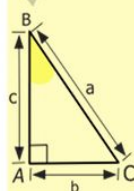
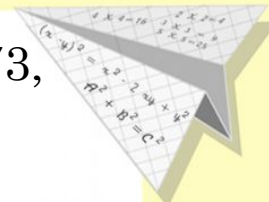


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

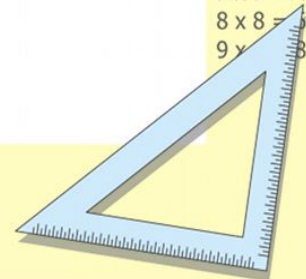
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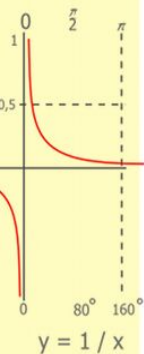
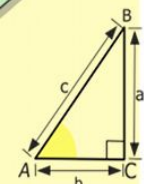
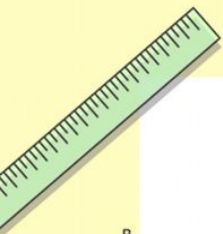
$x = 70$

$$(x+y)(x-y) = x^2 - y^2$$



$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$





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$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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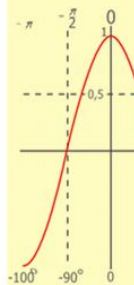
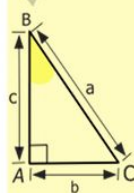
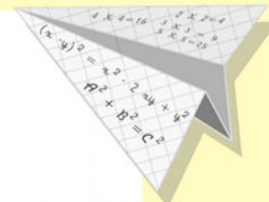
$$x = 70$$

$$-2^4\sqrt[4]{81} = -6$$

$$-3^3\sqrt[3]{-64} = 12$$

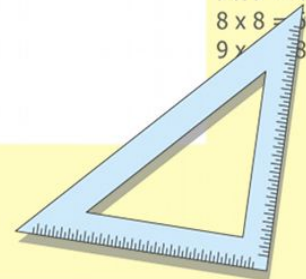
$$\sqrt[5]{32} + \sqrt[3]{-8} = 0$$

$$\sqrt[4]{625} - \sqrt[3]{-125} = 0$$



$$y = \cos$$

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Решить уравнения

№1076, 1077, 1078, 1085

$$x^3 = 125, x = 5$$

$$x^7 = \frac{1}{128}, x = \frac{1}{2}$$

$$x^4 = 17, x = \pm \sqrt[4]{17}$$

$$x^4 = -16, \text{ корней } _ \text{ нет}$$

$$x^3 + 8 = 0, x = -2$$

$$3x^8 - 9 = 0, x = \pm \sqrt[8]{3}$$

$$0,02x^6 - 1,28 = 0, x = 2$$

$$-\frac{3}{4}x^8 + 18\frac{3}{4} = 0, x = \pm \sqrt[8]{25}$$

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

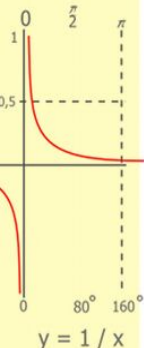
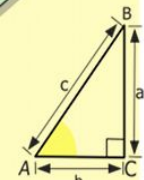
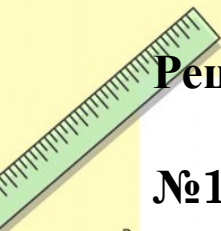
$$\sin 90^\circ = 1$$

$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

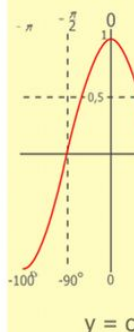
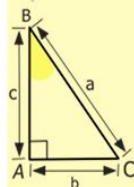
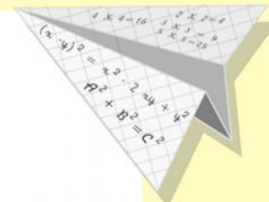
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

$$x = 70$$

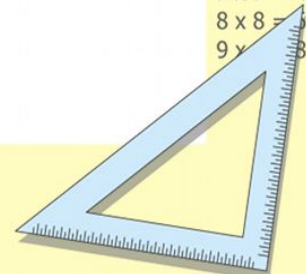
$$(x+y)(x-y) = x^2 - y^2$$



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



Иррациональные уравнения-уравнения, в которых переменная содержится под знаком корня

$$\sqrt{x-2} = 4$$

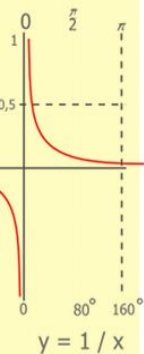
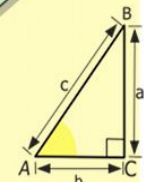
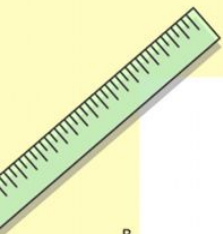
$$\sqrt[3]{x^2 - 2x - 3} = 0$$

$$\sqrt[4]{x-3} = -2$$

$$\sqrt[3]{x} = -2$$

№1079, 1080

Стр.73
№57-66



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



$$\frac{a}{A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

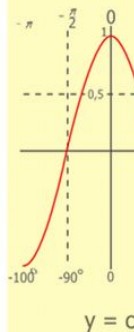
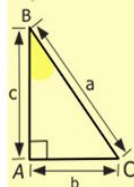
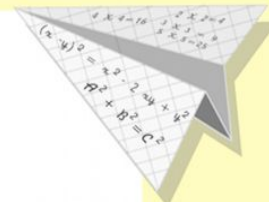
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

$$\sin 90^\circ = 1$$



$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \\ y = 1 \\ x = 25 + 45 \\ x = 70 \end{cases}$$

$$(x+y)(x-y) = x^2 - y^2$$



$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$

