

# 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.**

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

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

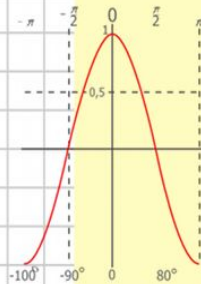
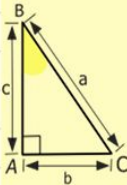
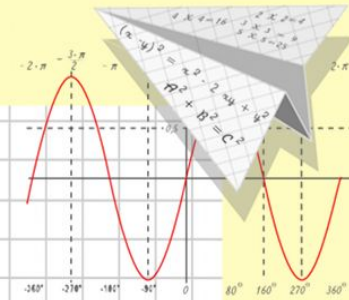
$$\sin 90^\circ = 1$$

$$x = 25y + 45$$

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

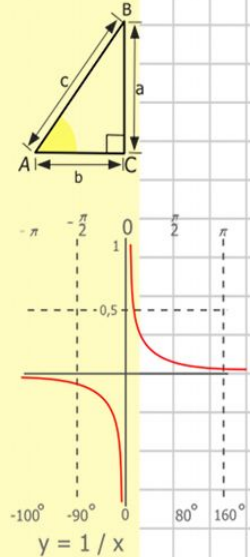
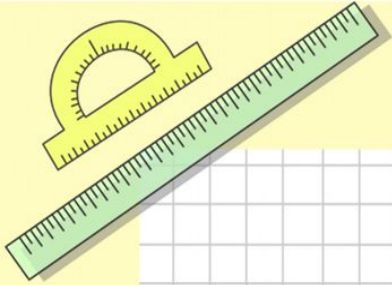
$$x = 70$$

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

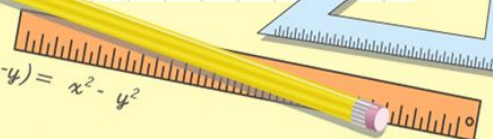
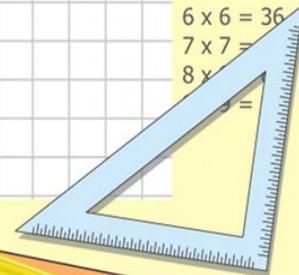


$$y = \cos x$$

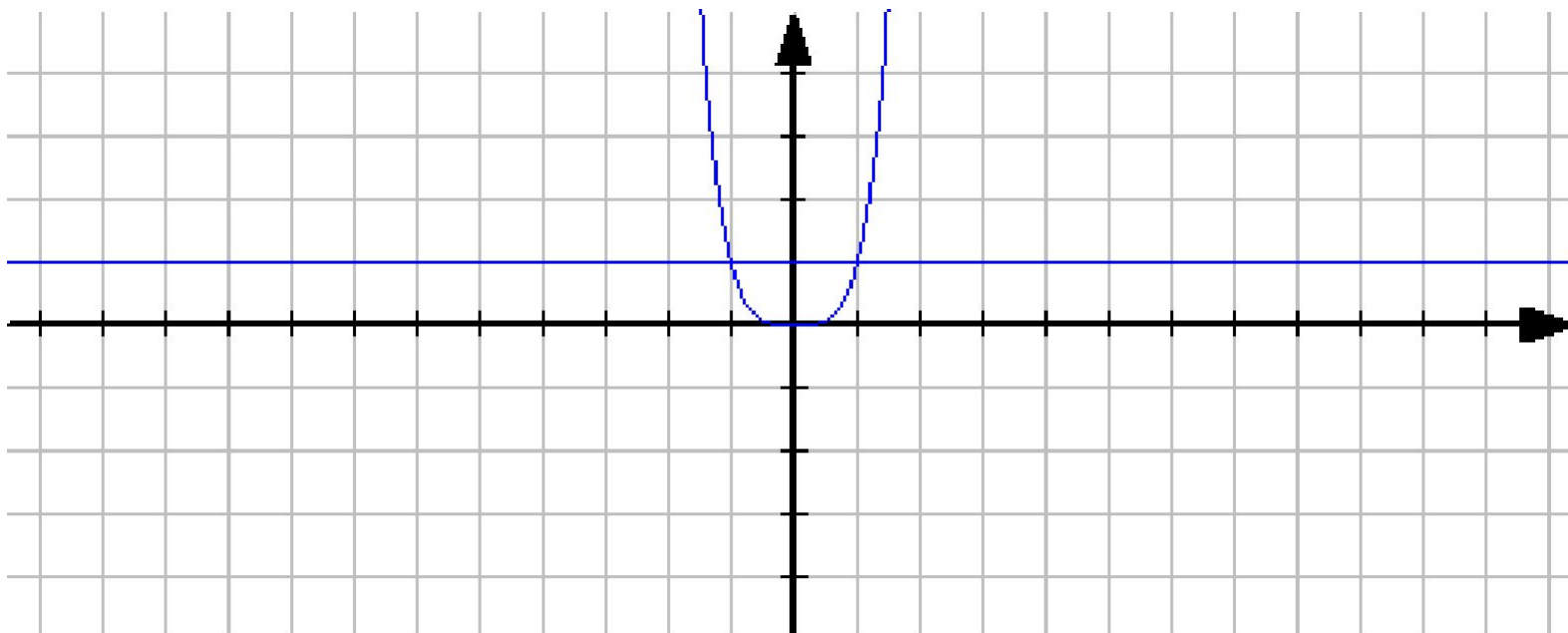
- $2 \times 2 = 4$
- $3 \times 3 = 9$
- $4 \times 4 = 16$
- $5 \times 5 = 25$
- $6 \times 6 = 36$
- $7 \times 7 = 49$
- $8 \times 8 = 64$



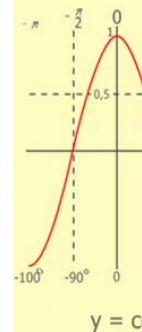
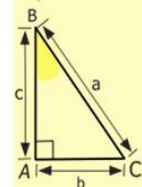
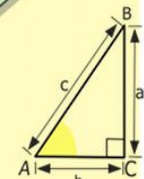
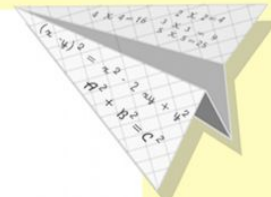
$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 2100 \\ + 8400 \\ \hline 105000 \end{array}$$



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



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



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

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



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

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

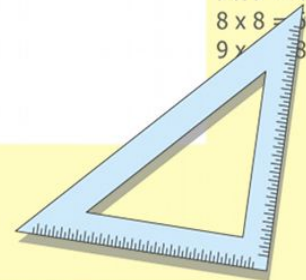
$$\sin 90^\circ = 1$$



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

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

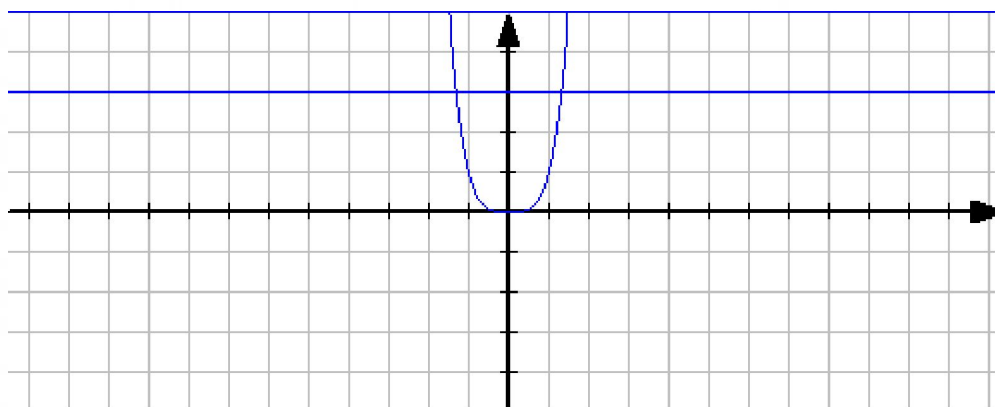
$$(x+y)(x-y) = x^2 - y^2$$



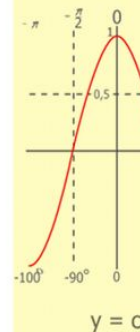
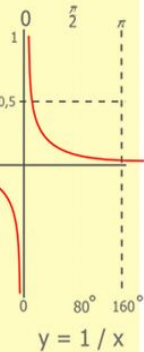
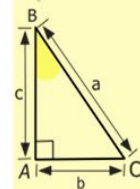
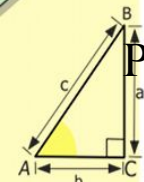
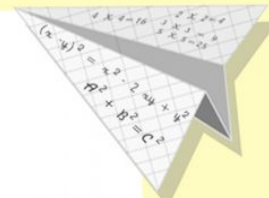
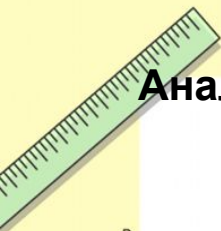
Аналогично, что уравнение  $x^4 = 4$  имеет два корня -2 и 2.

Решить уравнение

$$x^4 = 3$$



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



$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

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



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

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

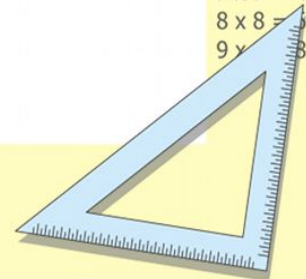
$$\sin 90^\circ = 1$$



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

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

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



Решить уравнение  $x^n = a$ ;

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

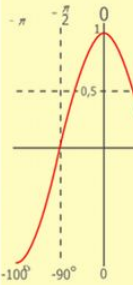
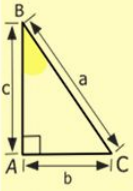
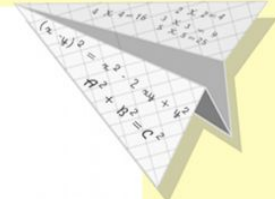
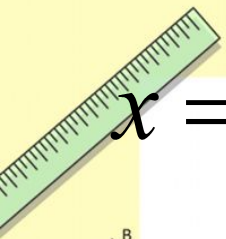
**Корнем  $n$  – й степени из неотрицательного числа  $a$  называют такое неотрицательное число, которое при возведении в степень  $n$  дает в результате число  $a$ .**

Число обозначают

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

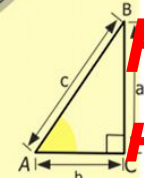
$$\sqrt{49} = 7; \sqrt[3]{0,125} = 0,5; \sqrt[7]{0} = 0; \sqrt[4]{17} \approx 2$$

где  $n$  –  
показатель  
корня,  $a$  –  
подкоренное  
число.



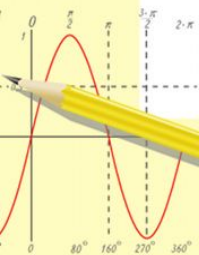
$y = \cos$

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



$y = 1/x$

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



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

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

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

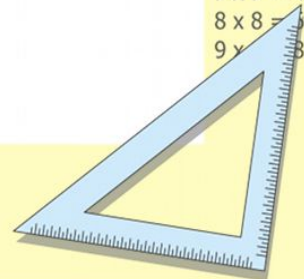


$$\begin{cases} y = \sin 90^\circ \\ x = 25y + 45 \end{cases}$$

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

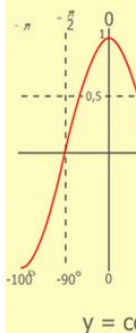
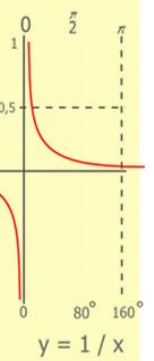
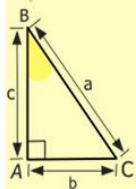
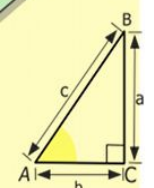
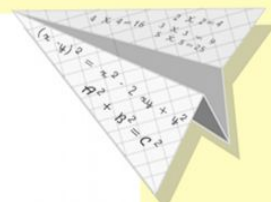
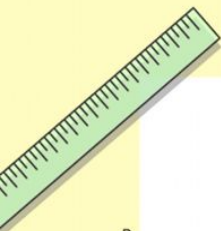
$$\frac{x}{70}$$

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



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

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



$$\begin{array}{r} \frac{1}{2} 500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

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



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

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

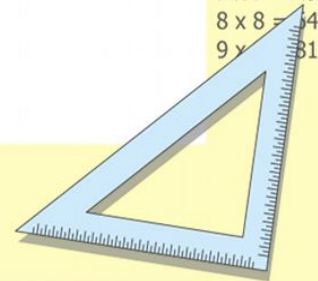
$$\sin 90^\circ = 1$$

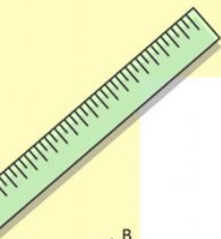


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

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





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

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

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

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

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

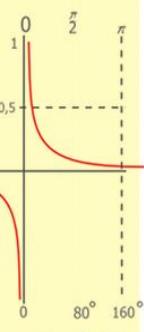
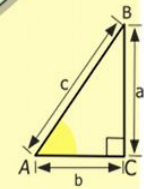
$$\sqrt[3]{0,125}$$

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

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

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

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



$$y = 1/x$$

$$\begin{array}{r} 1\ 5\ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105\ 000 \end{array}$$



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

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

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

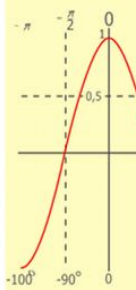
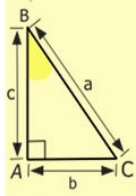
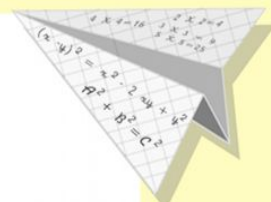


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

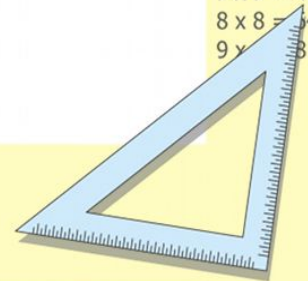
$$x = 70$$

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



$$y = \cos$$

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



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

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

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

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

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

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

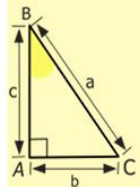
$$\sqrt[4]{5 \frac{1}{16}} = \frac{3}{2} = 1 \frac{1}{2}$$

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

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

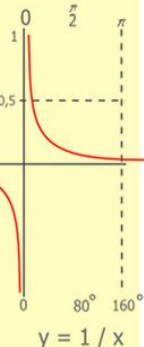
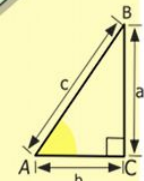
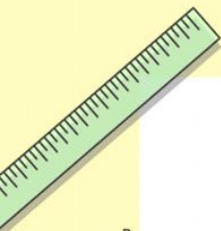
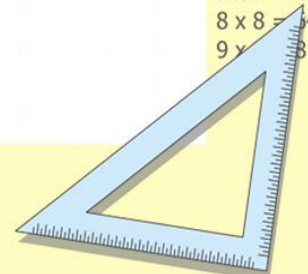
$$\sqrt[3]{-\frac{1}{8}} = -\frac{1}{2}$$

№1072, 1073,



y = cos

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

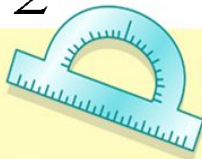


$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$


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

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

sin 90° = 1



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

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

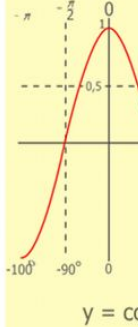
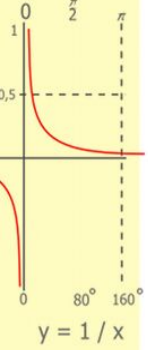
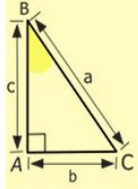
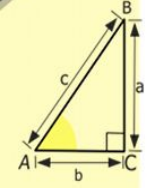
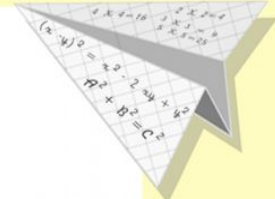
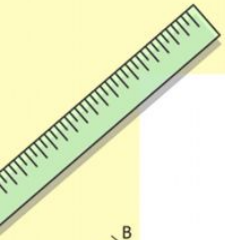
$$(x+y)(x-y) = x^2 - y^2$$

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

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

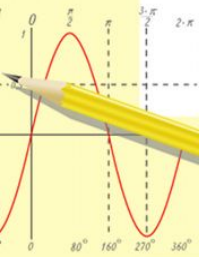
$$\sqrt[5]{32} + \sqrt[3]{-8} = 0$$

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



$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$

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



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

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

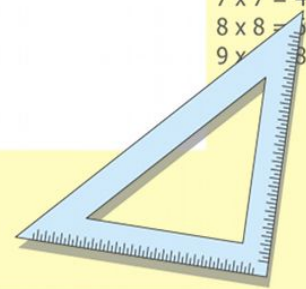
$$\sin 90^\circ = 1$$



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

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

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





# Решить уравнения

№1076, 1077, 1078, 1085

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

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

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

$$x^4 = -16, \text{корей \_ нет}$$

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

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

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

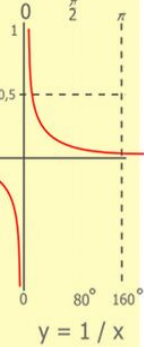
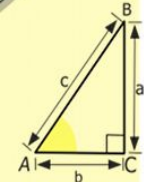
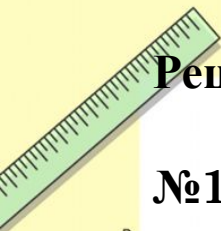
$$-\frac{3}{4}x^8 + 18\frac{3}{4} = 0, x = \pm \sqrt[8]{25}$$

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

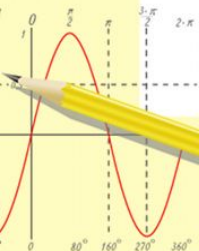
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

$$x = 70$$

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



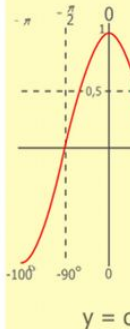
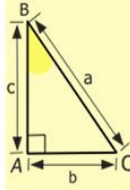
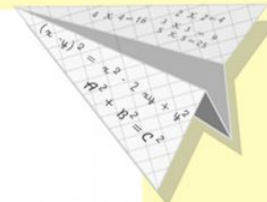
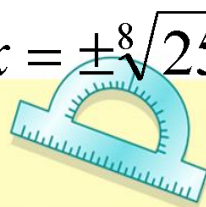
$$\begin{array}{r} \frac{1}{2} 5 00 \\ \times 42 \\ \hline 21 0 \\ + 84 \\ \hline 105 0 00 \end{array}$$



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

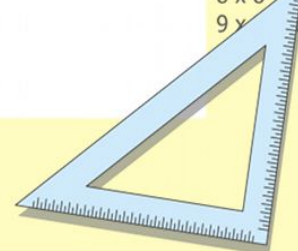
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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



$$y = \cos$$

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



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

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

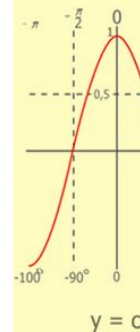
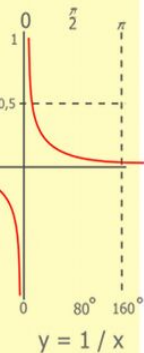
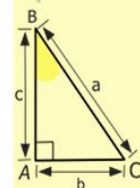
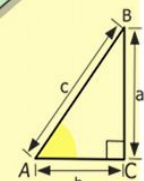
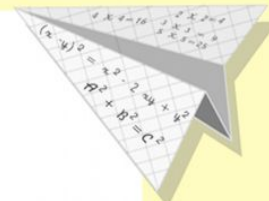
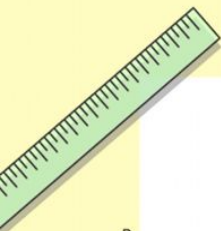
$$\sqrt[3]{x^2 - 2x - 3} = 0$$

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

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

№1079, 1080

Стр.73  
№57-66



$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

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



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

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

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



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

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

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

