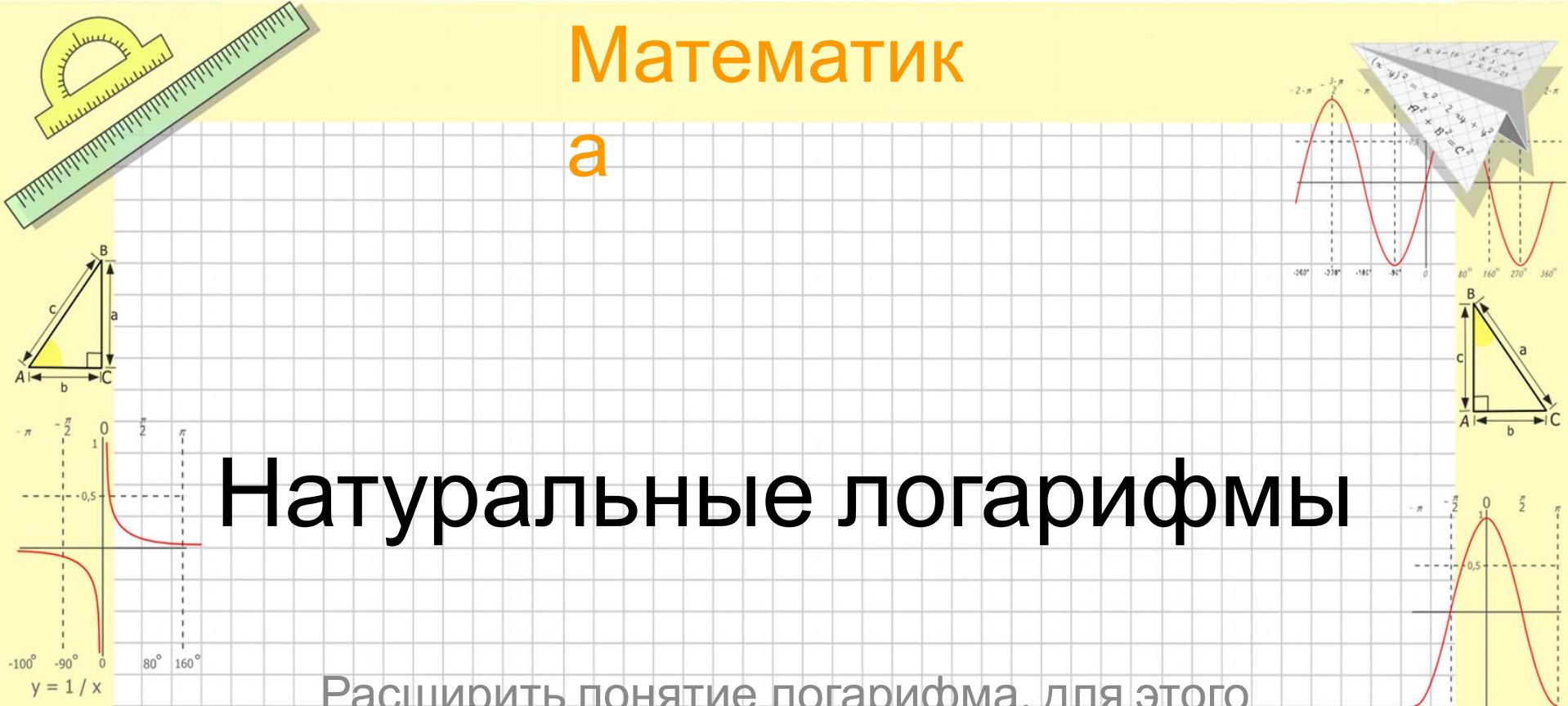
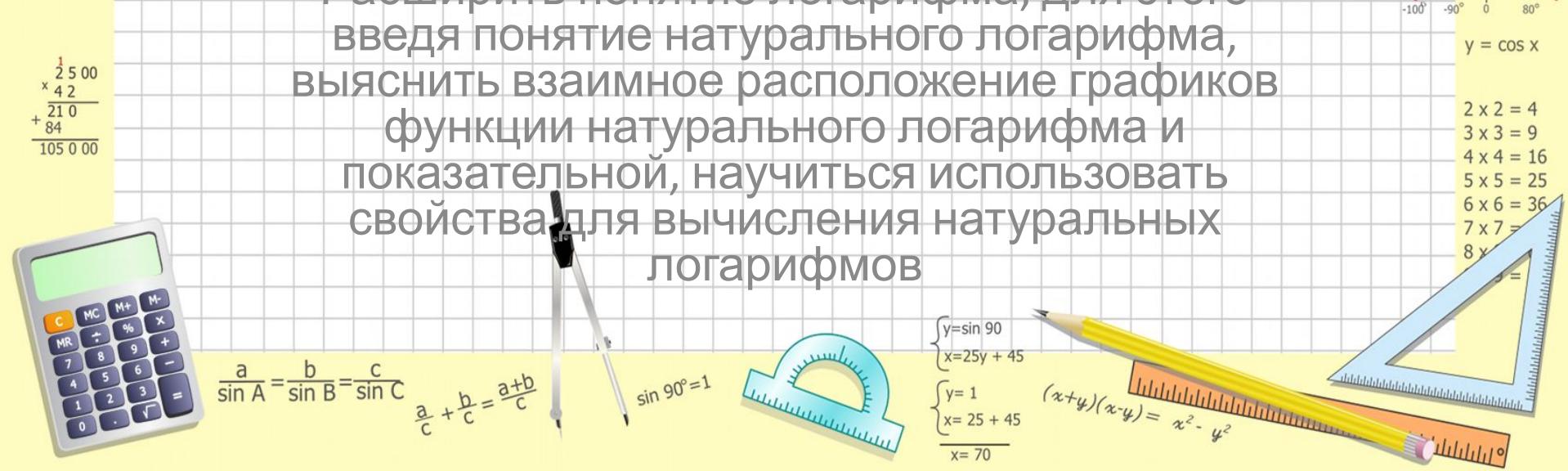


Математик а

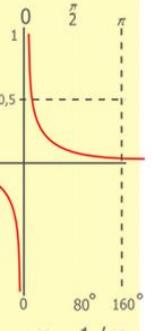


Натуральные логарифмы

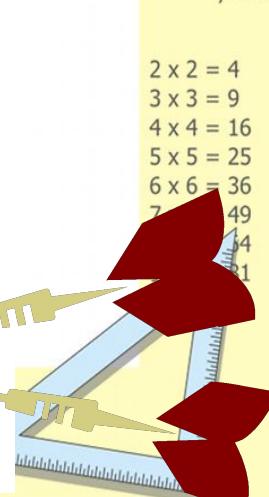
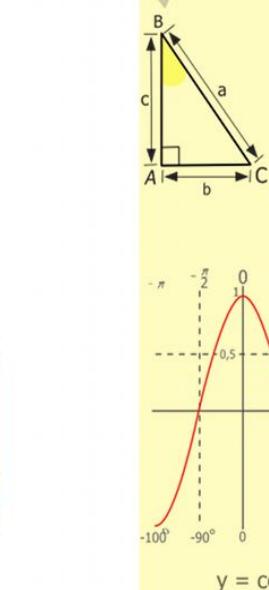
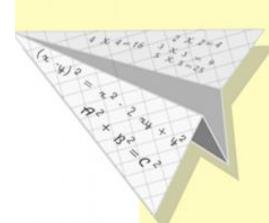
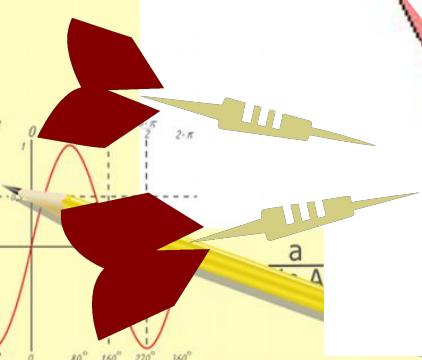
Расширить понятие логарифма, для этого введя понятие натурального логарифма, выяснить взаимное расположение графиков функции натурального логарифма и показательной, научиться использовать свойства для вычисления натуральных логарифмов



«Логарифмический дартс»

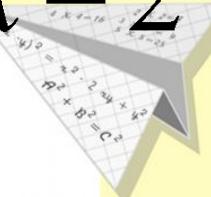


$$\begin{array}{r}
 & \overset{1}{2} 5 00 \\
 \times & 4 2 \\
 \hline
 + & 2 1 0 \\
 & 8 4 \\
 \hline
 1 0 5 0 0 0
 \end{array}$$

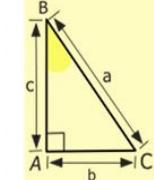


| | | | | | |
|----|--|-----------------|----|---|----------------|
| 1 | $\log_5 5^7$ | -2 | 11 | $\lg 1$ | 7 |
| 2 | $\log_{11} x = 2$ | 4 | 12 | $\log_x 7 = 1$ | 2 |
| 3 | $\log_1 4$ | 4 | 13 | $\log_2 16 = x$ | 4 |
| 4 | $\log_5 x = -3$ | 0,1 | 14 | $\log_7 7^4$ | 0 |
| 5 | $\lg 1000$ | 7 | 15 | $\log_{\frac{1}{5}} 3125$ | 4 |
| 6 | $\log_2 x = 2$ | 121 | 16 | $\log_x \frac{1}{343} = 3$ | 4 |
| 7 | $\lg x = -1$ | 3 | 17 | $\log_6 x = -2$ | -5 |
| 8 | $\log_x 4 = 1$ | -4 | 18 | $\log_7 49$ | $\frac{1}{36}$ |
| 9 | $\log_5 \frac{1}{625}$ | 0,04 | 19 | $\log_x 256 = 4$ | -5 |
| 10 | $\frac{a}{c} = \frac{b}{\sin B} \quad \frac{c}{\sin C} \quad x = 2^{2b}$ $\frac{a}{c} + \frac{b}{c} = \frac{2b}{c}$ | $\frac{1}{125}$ | | $y = \sin 90^\circ$ $x = 25y + 45$ $y = 1$ $x = 25 + 45$ $(x+y)(x-y) = x^2 - y^2$ | $x = 70$ |

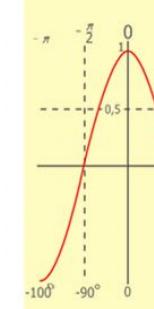
$$y = \log_2 x - 2$$



$$y = \lg x$$

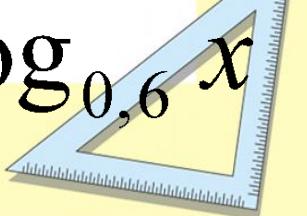


$$y = \log_{\frac{1}{2}} x$$



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

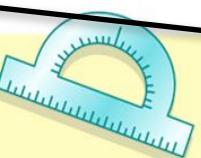
$$y = -\log_{0,6} x$$



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

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

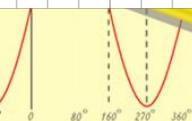
$x = 70$



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

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

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



$$y = e^x$$

Не является ни четной, ни нечетной; $D(f) = (-\infty; +\infty)$
Возрастает;
Не ограничена сверху, ограничена снизу
Не имеет наименьшего, наибольшего значений;
непрерывна
Выпукла вниз
Дифференцируема

$$E(f) = (-\infty; +\infty)$$

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

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

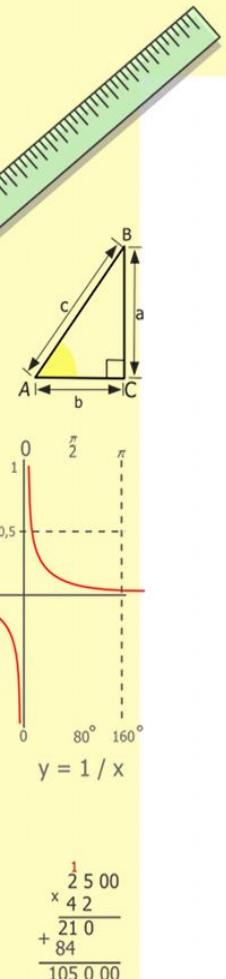
$$\sin 90^\circ = 1$$



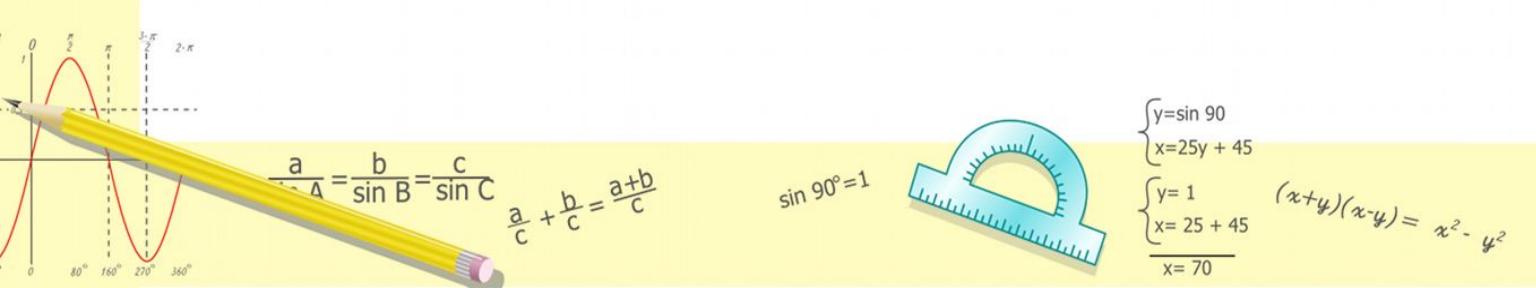
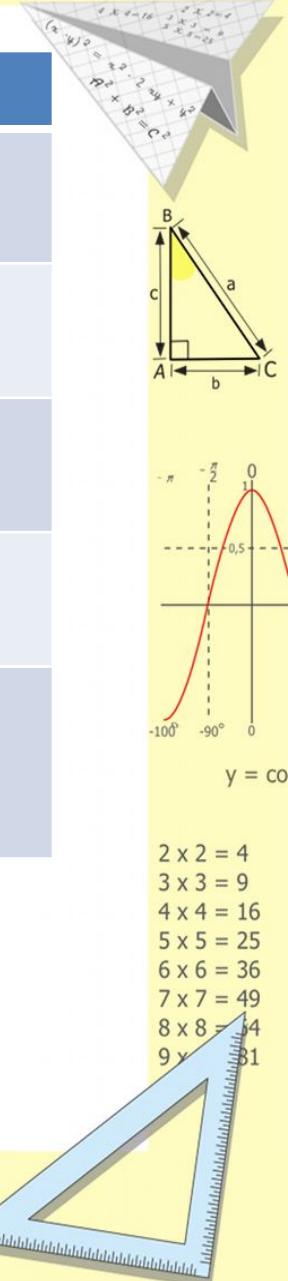
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ x = 70 \end{cases}$$

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

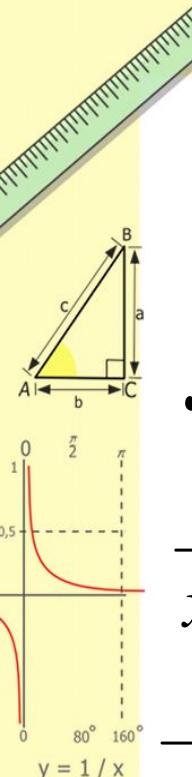
$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$



| Функция | Производная |
|----------------------------------|--------------------|
| $y = 2e^x$ | $y = 2e^x$ |
| $y = e^{2x}$ | $y = 2e^{2x}$ |
| $y = e^x - x$ | $y = e^x - 1$ |
| $y = e^{3x} - x^2$ | $y = 3e^{3x} - 2x$ |
| $y = \left(\frac{1}{e}\right)^x$ | $y = -e^x$ |



$$\int e^x dx = e^x + C$$


 x^n

$$\frac{1}{x^2}$$

$$\frac{1}{\sin^2 x}$$

$$\frac{1}{\cos^2 x}$$

$$\frac{x^{n+1}}{n+1}$$

$$-\frac{1}{x}$$

$$2\sqrt{x}; (x > 0)$$

-ctg x
tg x

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

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

cos x
-sin x
sin x
cos x

$$y = f(kx+b)$$

$$y = \frac{1}{k} F(kx+b)$$

$$y=f(x)+g(x)$$

$$Y=F(x)+G(x)$$

$$y=kf(x)$$

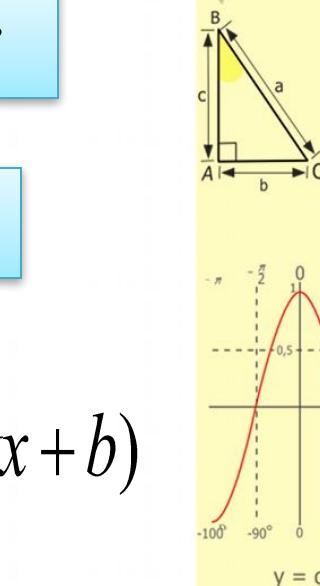
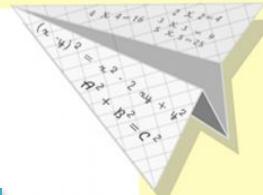
$$Y=kF(x)$$



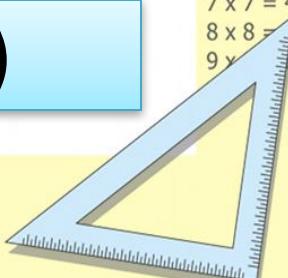
$$\sin 90^\circ = 1$$

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

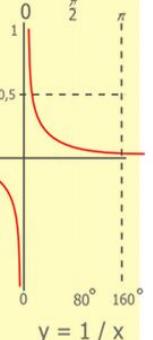
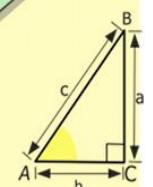
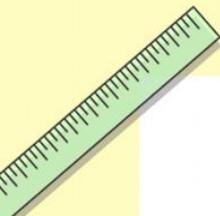
$$(x+y)(x-y) = x^2 - y^2$$



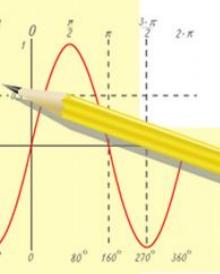
$$\begin{array}{l} 2=4 \\ 3=9 \\ 4=16 \\ 5=25 \\ 6 \cdot 6 = 36 \\ 7 \cdot 7 = 49 \\ 8 \cdot 8 = 64 \\ 9 \cdot 9 = 81 \end{array}$$



$$=F(b) - F(a).$$



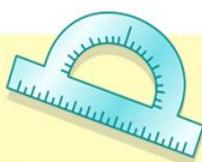
$$\begin{array}{r} 1 \\ \times 2500 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$



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

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

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

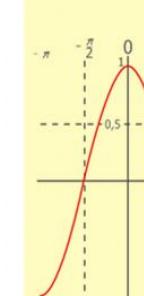
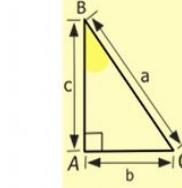
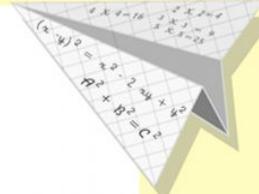


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

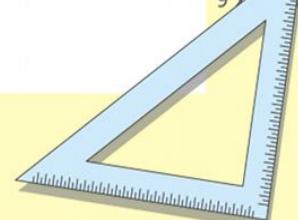
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

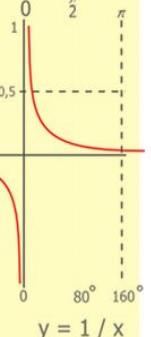
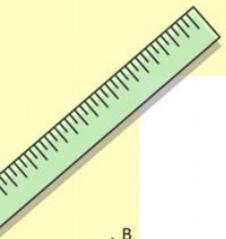
$$(x+y)(x-y) = x^2 - y^2$$

$$x = 70$$

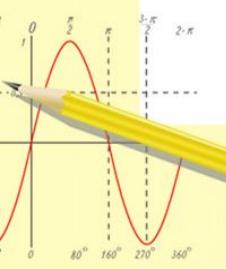


$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$



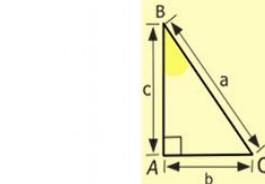
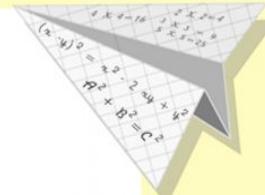


$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + \quad 210 \\ \hline 105000 \end{array}$$

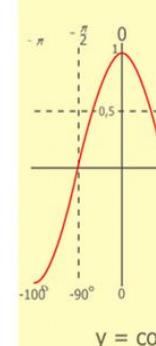


$$\int 3e^x dx$$

$$3e^x + C$$



$$\int \frac{dx}{x^2}$$



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

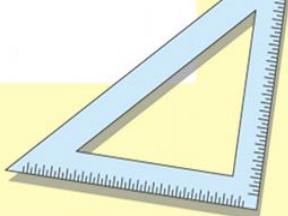
$$\sin 90^\circ = 1$$



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

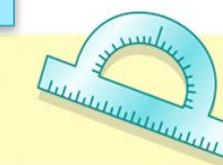
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases} \quad (x+y)(x-y) = x^2 - y^2$$

$$x = 70$$



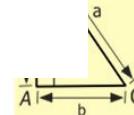
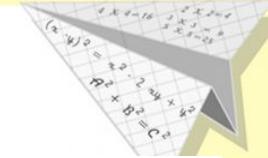
Десятичные логарифмы для наших потребностей являются весьма удобными. Однако при изучении высшей математики более удобными оказываются логарифмы по основанию $e = 2,718281828\dots$ (см. § 134, ч. 1). Употребление этих логарифмов позволяет значительно упростить большое количество математических формул. Логарифмы по основанию e получаются при решении многих физических задач и естественным образом входят в математическое описание некоторых химических, биологических и других процессов. Этим и объясняется их название «натуральные логарифмы».

Натуральный логарифм числа a обозначается $\ln a$. Сейчас имеются достаточно полные таблицы

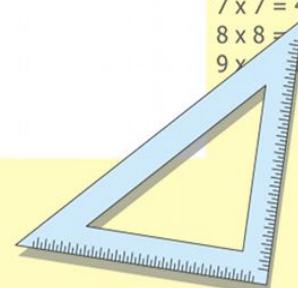


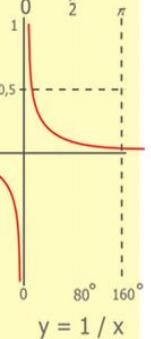
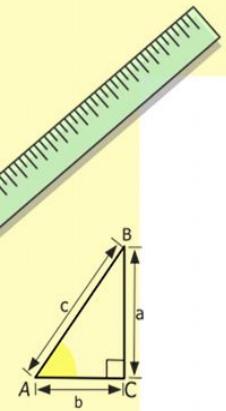
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$
$$(x+y)(x-y) = x^2 - y^2$$
$$x = 70$$

Логарифм по основанию e называется натуральным логарифмом

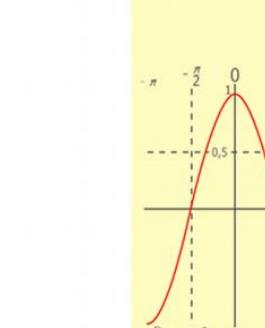
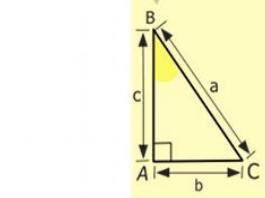
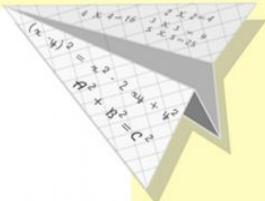
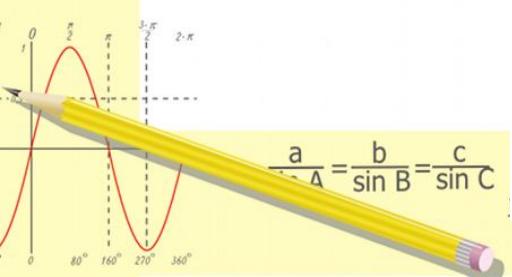


| |
|-------------------|
| $3 \times 3 = 9$ |
| $4 \times 4 = 16$ |
| $5 \times 5 = 25$ |
| $6 \times 6 = 36$ |
| $7 \times 7 = 49$ |
| $8 \times 8 = 64$ |
| $9 \times 9 = 81$ |





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



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

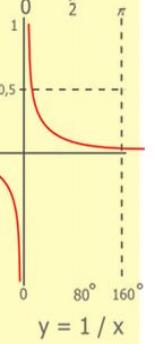
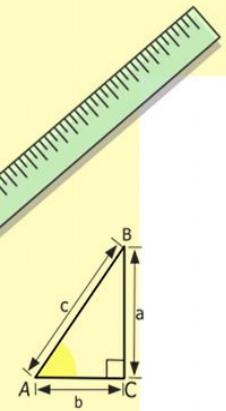
$$(x-y) = x^2 - y^2$$

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

Функция вида $y=\ln x$, свойства и график

The collage includes:

- A right triangle with legs a and b , hypotenuse c , and a yellow shaded area.
- A graph of the function $y = 1/x$ on a coordinate plane with axes labeled from 0 to π . It shows two branches: one in the first quadrant and one in the fourth quadrant.
- A multiplication problem: $\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ +84 \\ \hline 105000 \end{array}$
- A graph of the function $y = \cos x$ on a coordinate plane with axes labeled from - π to π . It shows a periodic wave with peaks at $x=0$ and $x=2\pi$, and troughs at $x=\pi$.
- A pencil writing on a graph of the function $y = \sin x$ on a coordinate plane with axes labeled from 0 to 2π . The graph shows a periodic wave with peaks at $x=0$ and $x=\pi$, and troughs at $x=\pi/2$ and $x=3\pi/2$.
- A right triangle with legs a and b , hypotenuse c , and a yellow shaded area.
- A graph of the function $y = \cos x$ on a coordinate plane with axes labeled from - π to π . It shows a periodic wave with peaks at $x=0$ and $x=2\pi$, and troughs at $x=\pi$.
- A multiplication problem: $\begin{array}{r} x 2545 \\ \hline x 70 \\ \hline 17985 \end{array}$
- A grid with various formulas:
 - $(x-y)^2 = x^2 - 2xy + y^2$
 - $x^2 - y^2 = (x-y)(x+y)$
 - $x^2 - y^2 = x^2 - y^2$
 - $x^2 - y^2 = x^2 - y^2$
- A grid with multiplication tables:
 - $2 \times 2 = 4$
 - $3 \times 3 = 9$
 - $4 \times 4 = 16$
 - $5 \times 5 = 25$
 - $6 \times 6 = 36$
 - $7 \times 7 = 49$
 - $8 \times 8 = 64$
 - $9 \times 9 = 81$

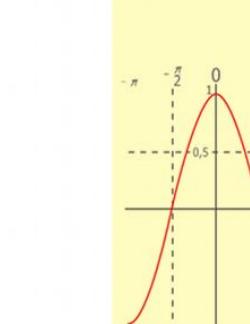
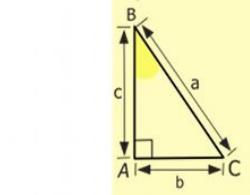
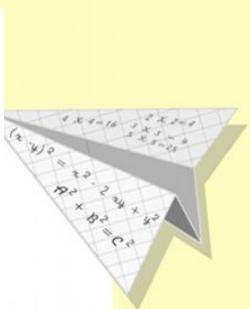
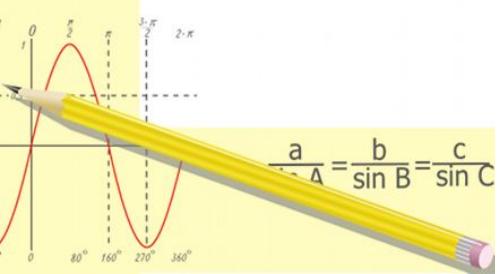


$$\begin{array}{r} \overset{1}{\cancel{x}} \\ \times 2500 \\ \hline \end{array}$$

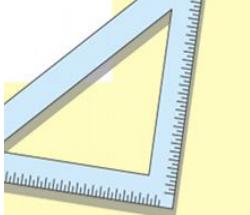
$$\begin{array}{r} \overset{1}{\cancel{x}} \\ \times 42 \\ \hline + \quad \quad \\ \hline \end{array}$$

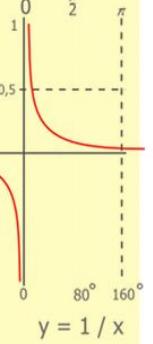
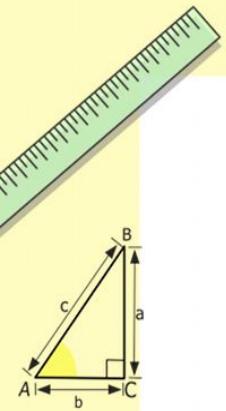
$$\begin{array}{r} \overset{1}{\cancel{x}} \\ \times 210 \\ \hline + \quad \quad \\ \hline 84 \\ \hline \end{array}$$

$$\begin{array}{r} \overset{1}{\cancel{x}} \\ \times 105000 \\ \hline \end{array}$$

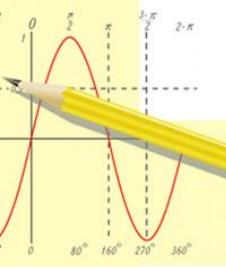


$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$



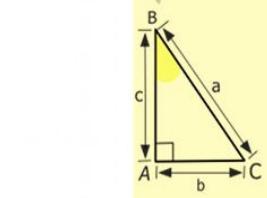
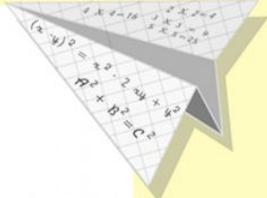


$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + \quad 210 \\ \hline 105000 \end{array}$$

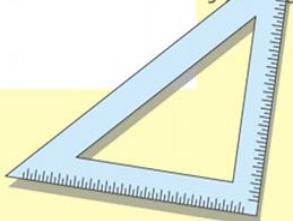


1633, 1634, 1635, 1636(а,б)
Дома: в,г

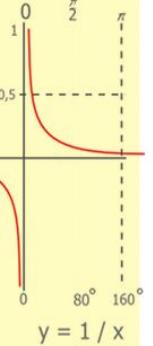
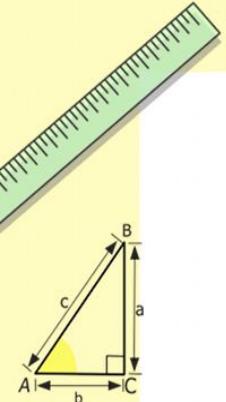
$x = 70$



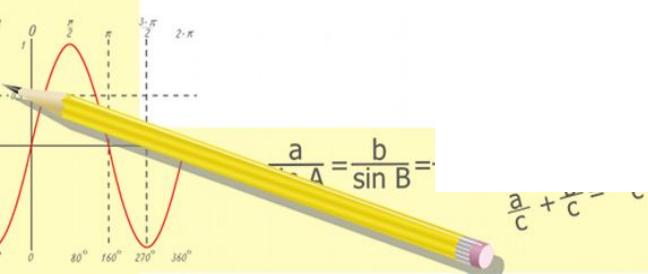
$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$



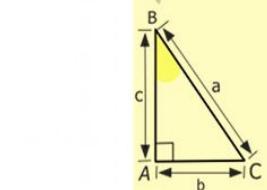
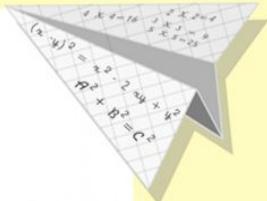
№1633



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



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

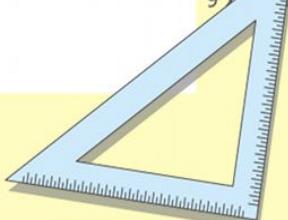


$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$

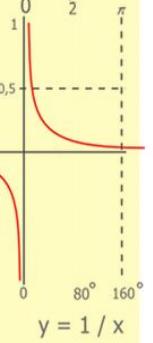
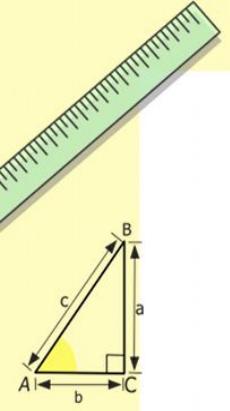


$$\left\{ \begin{array}{l} x = 25 + 45 \\ x = 70 \end{array} \right.$$

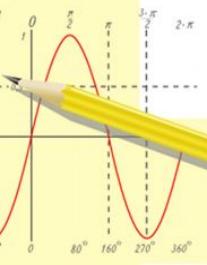
$$x^2 - y^2 = (x+y)(x-y)$$



№1634



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



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

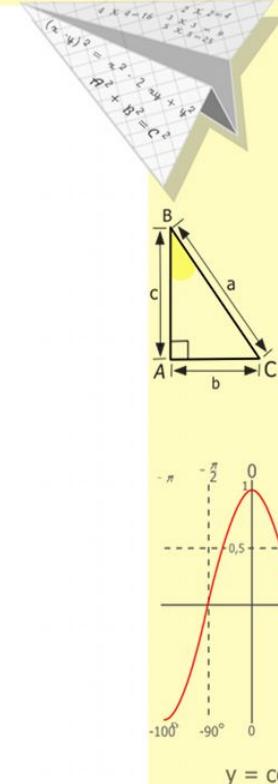
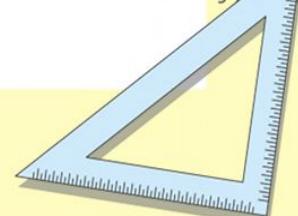
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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



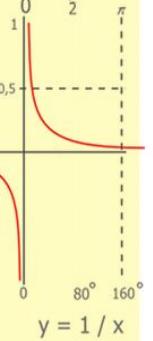
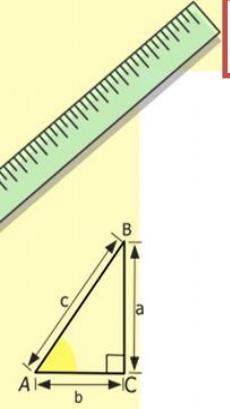
$$\begin{cases} x = 25y + 45 \\ y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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

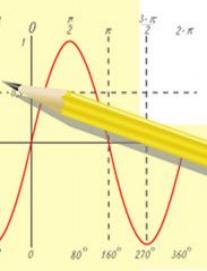


$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$

№1635

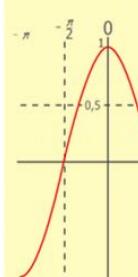
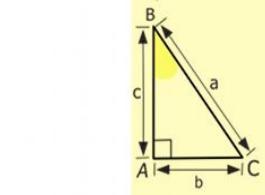
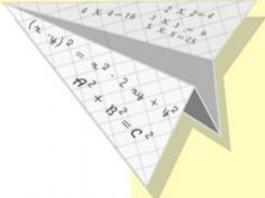


$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + \quad 210 \\ \hline 105000 \end{array}$$



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

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



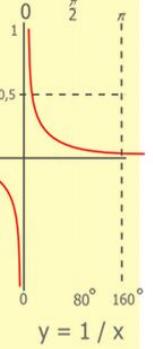
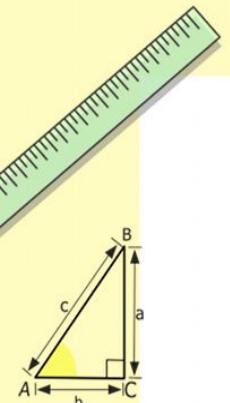
$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$



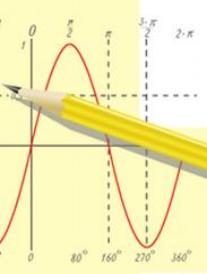
$$\begin{cases} x = 25 + 45 \\ x = 70 \end{cases}$$

$$y^2 = x^2 - y^2$$

№1636



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

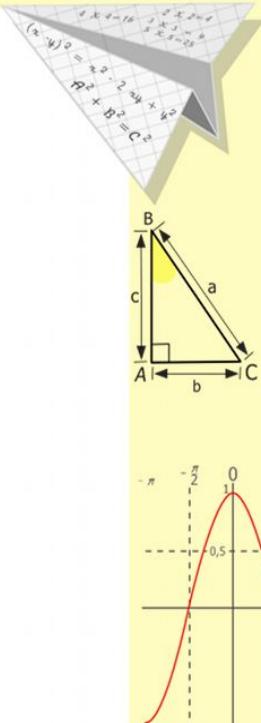


$$\frac{a}{c} = \frac{b}{\sin B} = \frac{c}{\sin C}$$
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

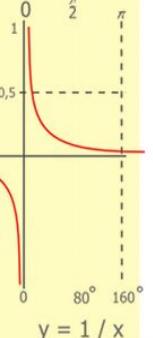
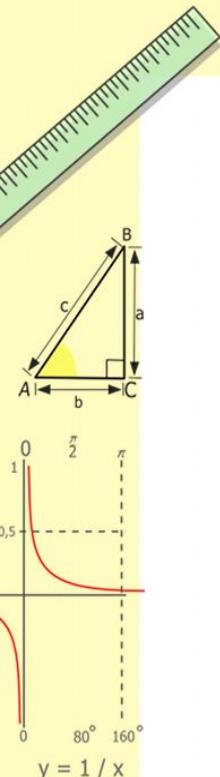


$$\begin{cases} y=1 \\ x=25+45 \\ \hline x=70 \end{cases}$$
$$(x+y)(x-y) = x^2 - y^2$$



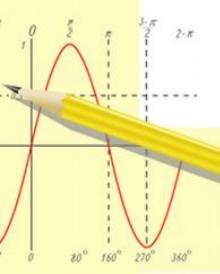
$$\begin{aligned} &= 4 \\ &= 9 \\ &= 16 \\ &= 25 \\ &= 36 \\ &= 49 \\ &= 14 \\ &= 31 \end{aligned}$$

**Составить уравнение касательной к
графику функции $y=\ln x$ в точке $x=e$**



**№1623,1637,16
41 (а,б)
В,Г - дома**

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



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

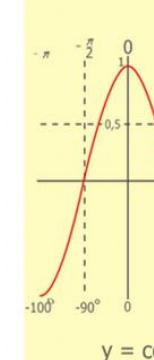
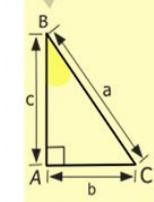
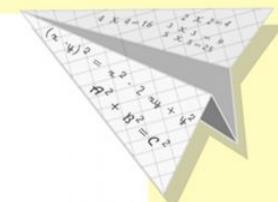
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

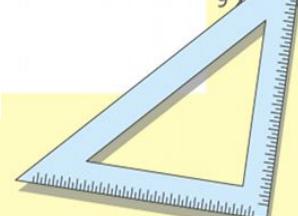


$$\begin{cases} y=1 \\ x=25+45 \\ \hline x=70 \end{cases}$$

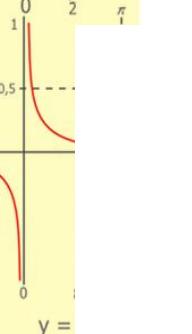
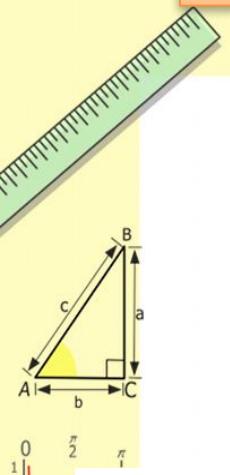
$$(x+y)(x-y) = x^2 - y^2$$



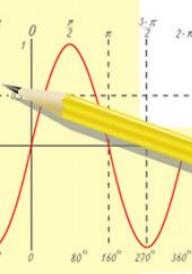
$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



№1642, 1643



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



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

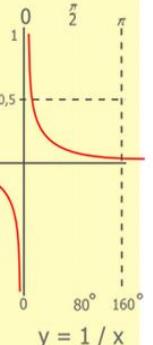
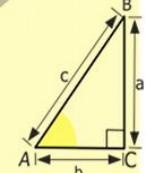
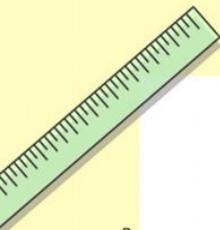
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$



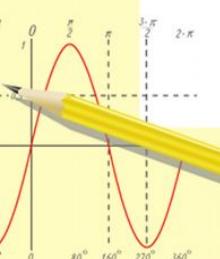
4
9
16
25
36
49
14
31

$x = 70$

Вычислить площадь фигуры, ограниченной прямыми $y=0$, $x=1$, $x=e$ и гиперболой



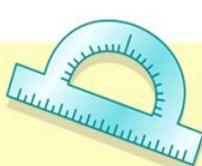
$$\begin{array}{r} 1 \\ \times 2500 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$



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

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

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

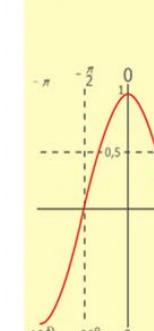
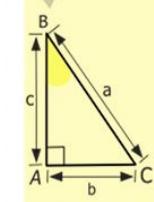
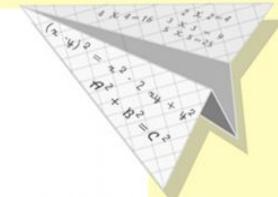


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

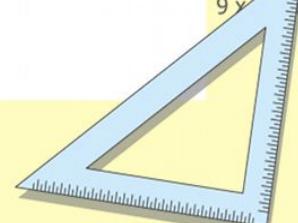
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

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

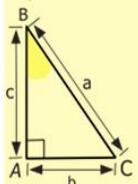
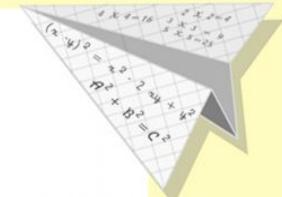
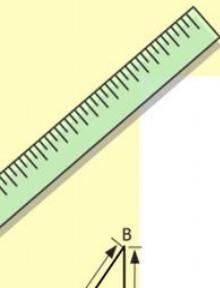
$$x = 70$$



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



№1628, 1629, 1642, 1645 (а,б) дома: в,г



4
9
16
25
36
49
14
61



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

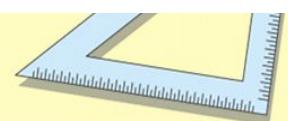
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

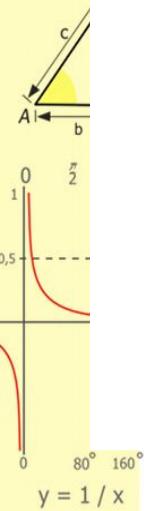
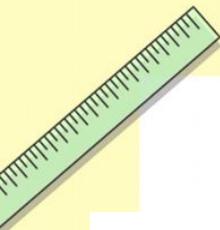


$$\begin{cases} y=1 \\ x=25+45 \\ \hline x=70 \end{cases}$$

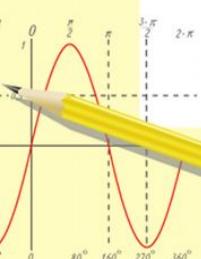
$$(x+y)(x-y) = x^2 - y^2$$



№1629 (a)



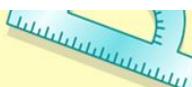
$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + \quad \quad \quad 210 \\ \hline 105000 \end{array}$$



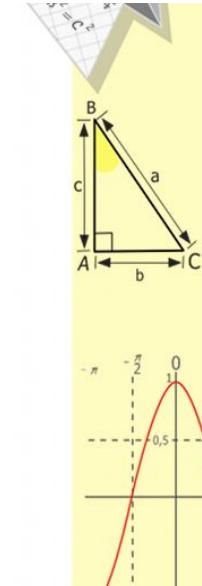
$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

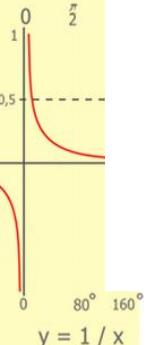
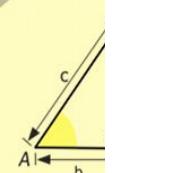
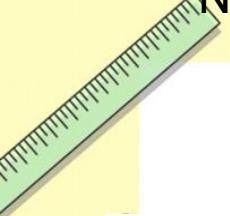
$$\sin 90^\circ$$



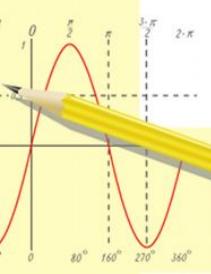
$$\begin{cases} y=1 \\ x=25+45 \\ \hline x=70 \end{cases} \quad (x+y)(x-y) = x^2 - y^2$$



№1629(б)



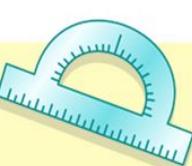
$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + 210 \\ \hline 84 \\ \hline 105000 \end{array}$$



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

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

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

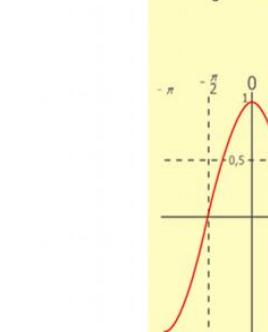
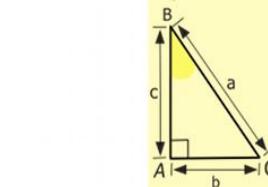
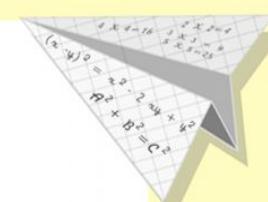


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

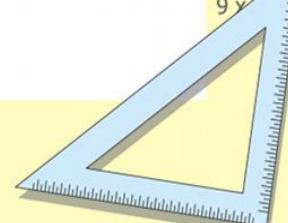
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

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

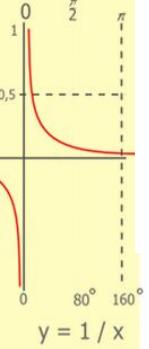
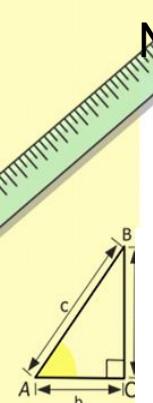
$$x = 70$$



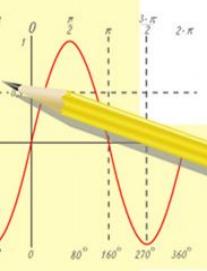
$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$



№1642



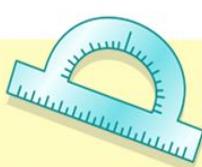
$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + 210 \\ \hline 105000 \end{array}$$



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

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

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

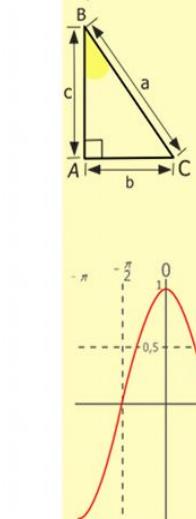
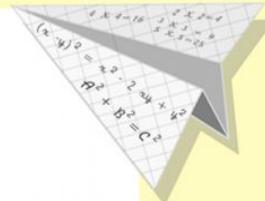


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

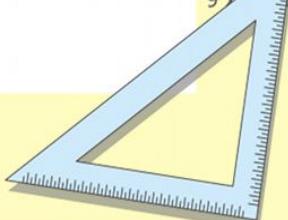
$$(x+y)(x-y) = x^2 - y^2$$

$$x = 70$$

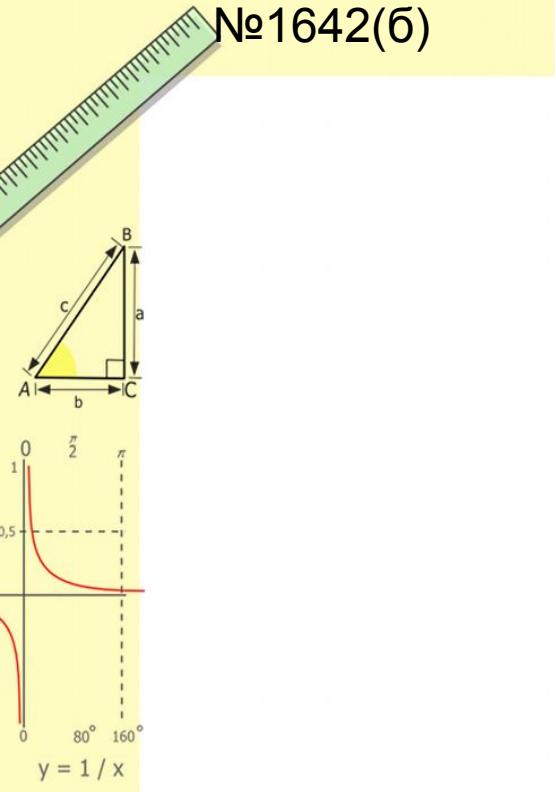


$$\begin{aligned} x & 2 = 4 \\ x & 3 = 9 \\ x & 4 = 16 \\ x & 5 = 25 \\ x & 6 = 36 \\ x & 7 = 49 \\ x & 8 = 64 \end{aligned}$$

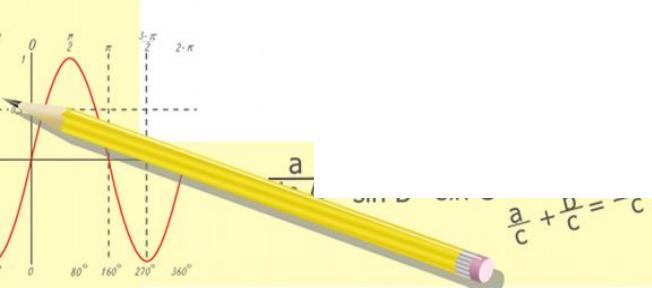
71



№1642(б)



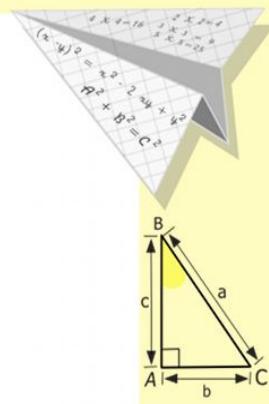
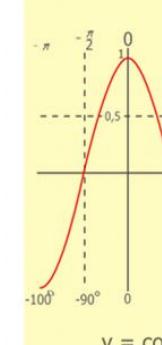
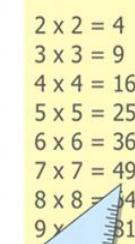
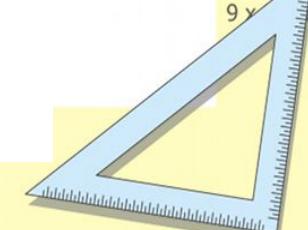
$$\begin{array}{r}
 & ^12500 \\
 \times & 42 \\
 \hline
 & 210 \\
 + & 84 \\
 \hline
 & 10500
 \end{array}$$



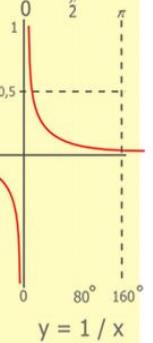
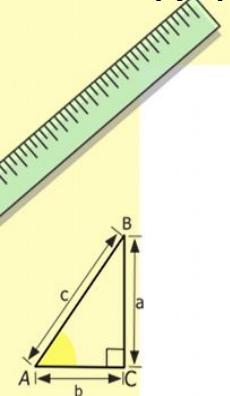
$$\frac{a}{c} + \frac{b}{c} = -c$$



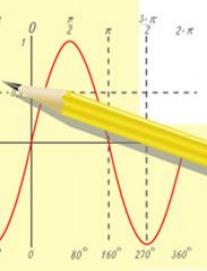
$$\begin{cases} x = 25 + 45 \\ \hline x = 70 \end{cases}$$



№1645 (a)



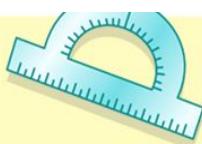
$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + \quad 210 \\ \hline 105000 \end{array}$$



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

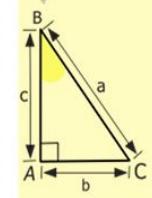
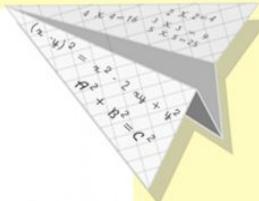
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

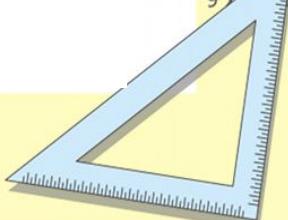


$$\begin{cases} x=25y+45 \\ y=1 \\ x=25+45 \\ \hline x=70 \end{cases}$$

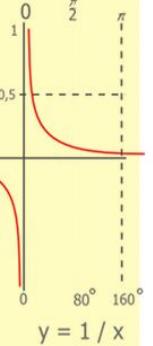
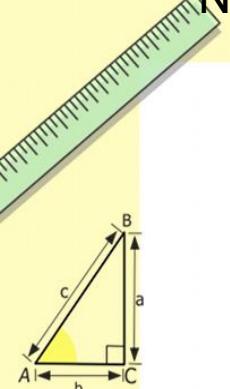
$$(x+y)(x-y) = x^2 - y^2$$



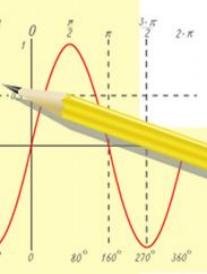
$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$



№1645(б)



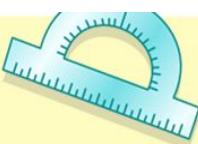
$$\begin{array}{r} \frac{1}{2500} \\ \times 42 \\ \hline + \quad 210 \\ \hline 105000 \end{array}$$



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

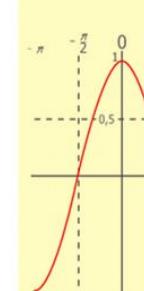
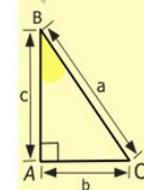
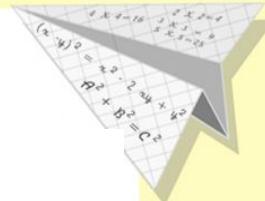
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

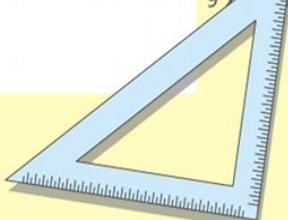


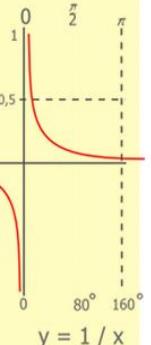
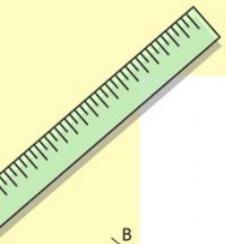
$$\begin{cases} x=25y+45 \\ y=1 \\ x=25+45 \\ \hline x=70 \end{cases}$$

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

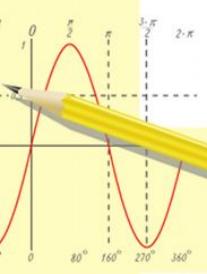


$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \\ 9 \times 9 &= 81 \end{aligned}$$





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



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

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

ЕГЭ

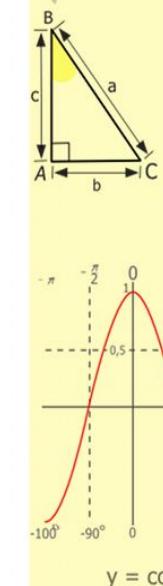
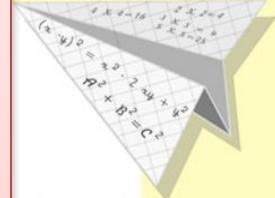
Задание на каникулы:

Создать справочник по формулам (лучше напечатать, чтобы можно было размножить), презентация, видеоролик и т.п.

1. Тригонометрические формулы
2. Тригонометрические уравнения (общий вид, частные случаи, методы решения)
3. Производная
4. Применение производной к исследованию функций
5. Функции, свойства, графики, преобразования
6. Первообразная и интеграл
7. Показательные уравнения и неравенства
8. Логарифмические уравнения и неравенства
9. Степени и корни
10. Системы уравнений
11. Основные типы задач

12. РЕШАТЬ ВАРИАНТЫ ЕГЭ

$$\begin{aligned} & \left\{ \begin{array}{l} y = 25x + 45 \\ y = 2x + 70 \end{array} \right. \\ & x = 25 + 45 \\ & x = 70 \end{aligned}$$



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

