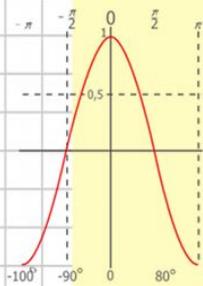
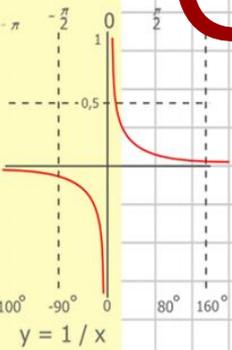
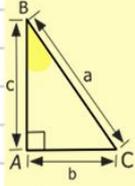
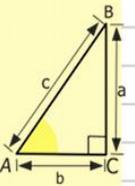
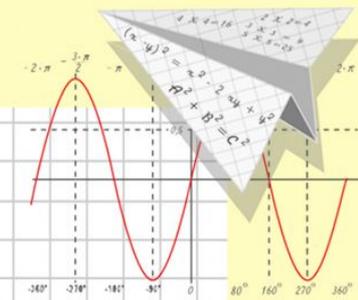
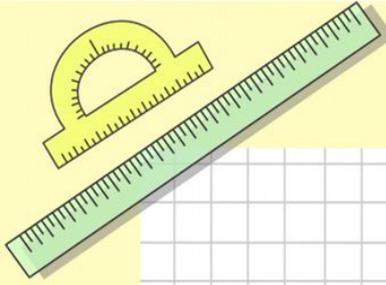


Математик

а

Скобки в числовом выражении

МБОУ «Лицей № 35»,
Учитель математики:
Иванова Кристина Евгеньевна



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

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

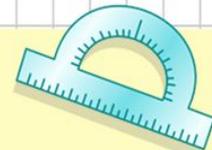


$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

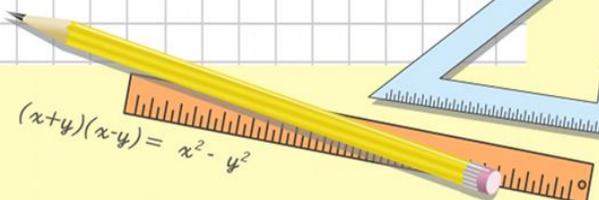
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$



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

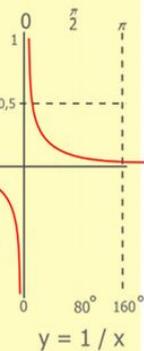
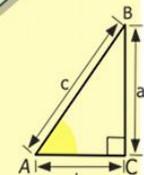
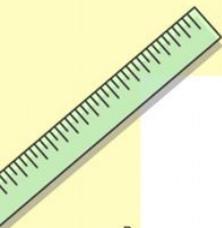
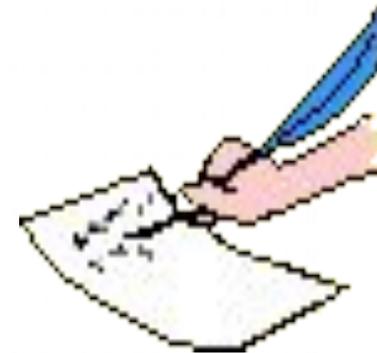


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ x = 70 \end{cases}$$

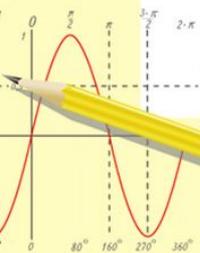


$$(x+y)(x-y) = x^2 - y^2$$

Именно математика дает
надежнейшие правила: кто им
следует - тому не опасен обман
чувств.



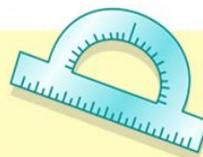
$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



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

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

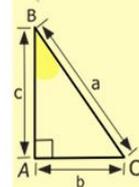
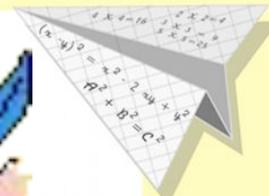
$$\sin 90^\circ = 1$$



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

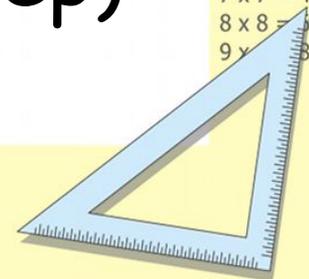
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



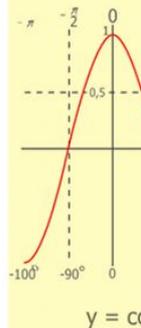
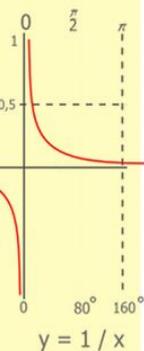
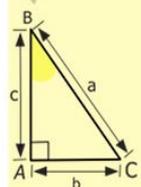
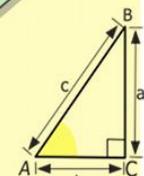
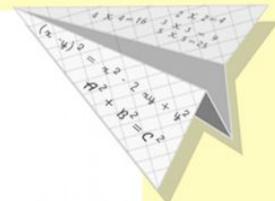
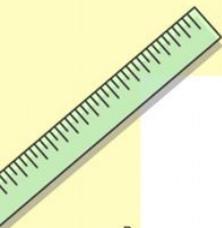
$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$

(Леонард Эйлер)



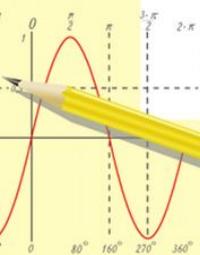
Устная работа:

1. Какие числа называют натуральными?
2. Какое число не считается натуральным числом?
3. Как можно представить любое натуральное число?
4. Какие действия мы можем выполнять с натуральными числами?



$$\begin{array}{r} 1\ 2\ 5\ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105\ 000 \end{array}$$

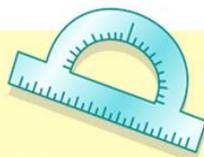
$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



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

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

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

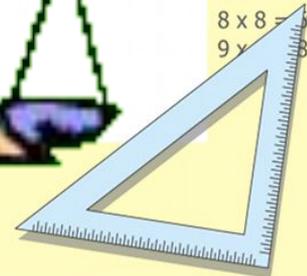


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

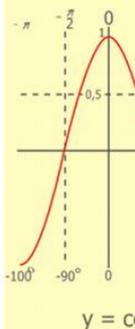
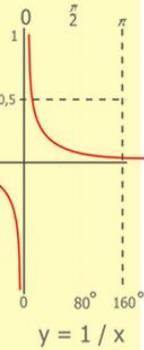
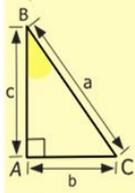
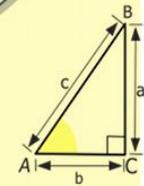
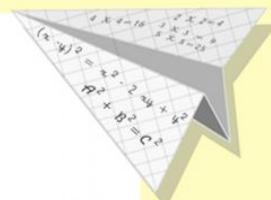
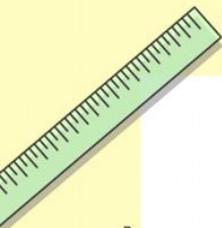
$$x = 70$$

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



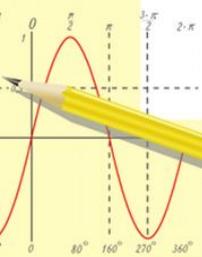
Устная работа:

5. С помощью каких математических знаков записываются эти действия?
6. Как называется запись, представленная с помощью чисел и знаков математических действий?
7. Какой еще математический знак может содержать числовое выражение?
8. Кто готов сформулировать тему сегодняшнего урока?



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

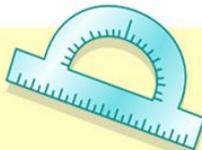
- 2 x 2 = 4
- 3 x 3 = 9
- 4 x 4 = 16
- 5 x 5 = 25
- 6 x 6 = 36
- 7 x 7 = 49
- 8 x 8 = 64
- 9 x 9 = 81



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

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

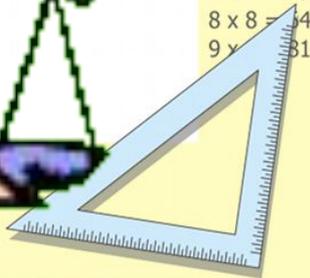
$$\sin 90^\circ = 1$$



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

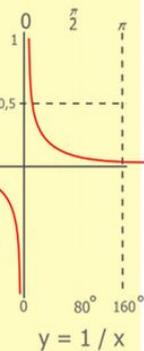
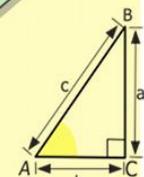
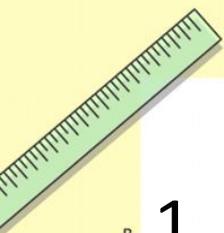
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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

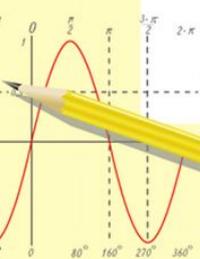


Задача-исследование № 1.

1. Запишите выражение $420:6+4\cdot 2$ и найдите его значение.
2. Вновь запишите данное выражение и расставьте в нем скобки всеми возможными способами.
3. Найдите значение полученных выражений.
4. Сравните значения полученных выражений со значением выражения $420:6+4\cdot 2$.
5. Сделайте вывод о том, в каких случаях при расстановке скобок не изменяется значение числового выражения.



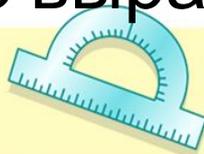
$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$



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

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

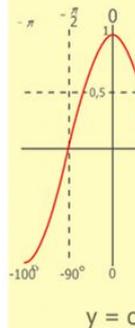
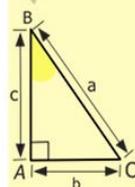
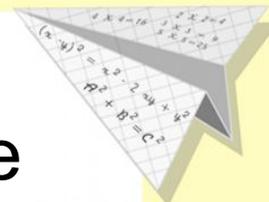
$$\sin 90^\circ = 1$$



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

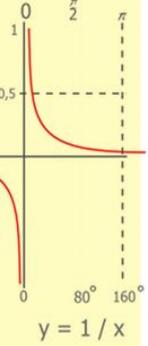
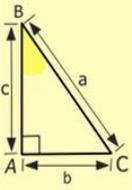
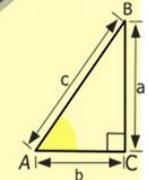
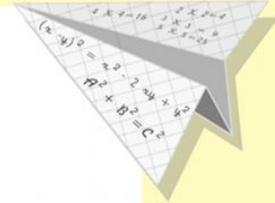
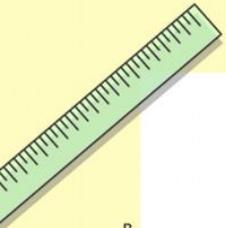
$$\begin{cases} x = 25 + 45 \\ x = 70 \end{cases}$$

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



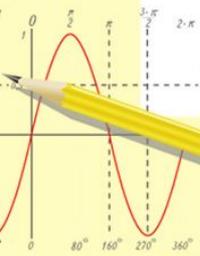
420:6+4·2=78

1. $(420:6)+4\cdot 2=78$
2. $420:6+(4\cdot 2)=78$
3. $(420:6)+(4\cdot 2)=78$
4. $420:(6+4)\cdot 2=84$
5. $420:((6+4)\cdot 2)=21$
6. $(420:(6+4))\cdot 2=84$
7. $(420:6+4)\cdot 2=148$
8. $420:(6+4\cdot 2)=30$



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

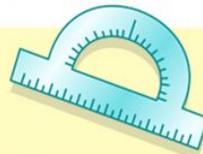
- $2 \times 2 = 4$
- $3 \times 3 = 9$
- $4 \times 4 = 16$
- $5 \times 5 = 25$
- $6 \times 6 = 36$
- $7 \times 7 = 49$
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- $9 \times 9 = 81$



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

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

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

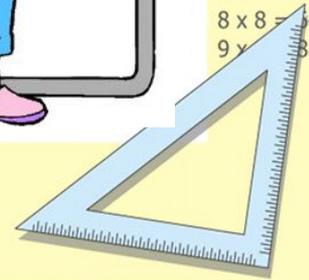


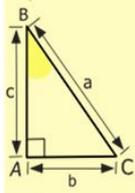
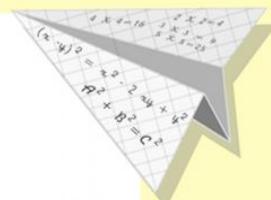
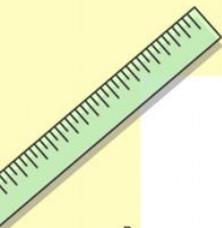
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

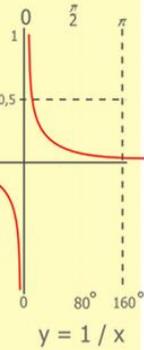
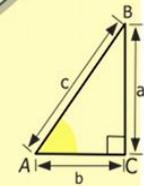
$$x = 70$$

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

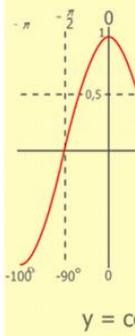




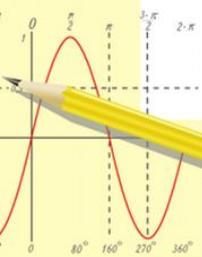
Гипотеза к Задаче-исследование № 1: при расстановке скобок не надо выделять скобками действия умножения и деления чисел, так как значение числового выражения не меняется.



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



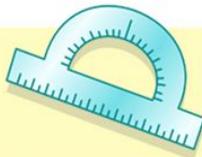
- 2 x 2 = 4
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$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

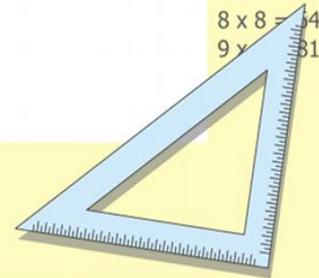
$$\sin 90^\circ = 1$$



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

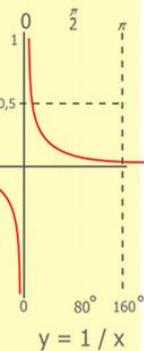
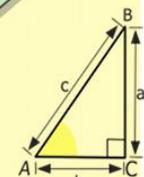
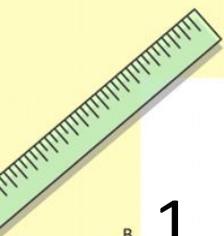
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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

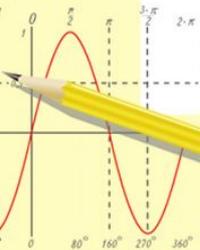


Задача-исследование № 2.

1. Запишите выражение $145-45-30:5$ и найдите его значение.
2. Вновь запишите данное выражение и расставьте в нем скобки всеми возможными способами.
3. Найдите значение полученных выражений.
4. Сравните значения полученных выражений со значением выражения $145-45-30:5$.
5. Сделайте вывод о том, в каких случаях при расстановке скобок не изменяется значение числового выражения.



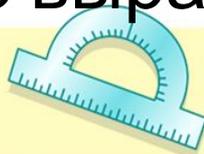
$$\begin{array}{r} 1\ 2\ 5\ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105\ 000 \end{array}$$



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

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

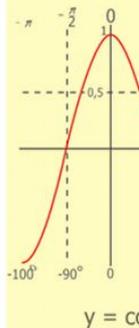
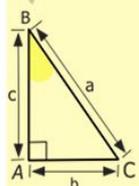
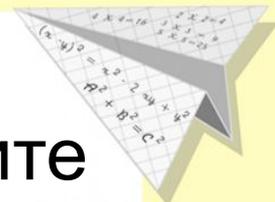
$$\sin 90^\circ = 1$$



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

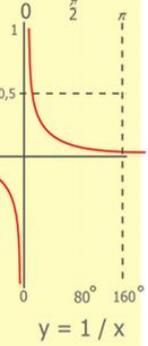
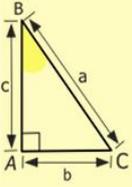
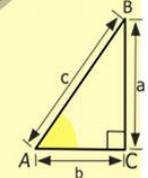
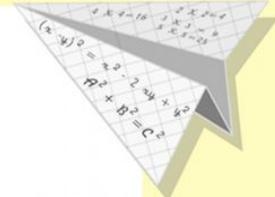
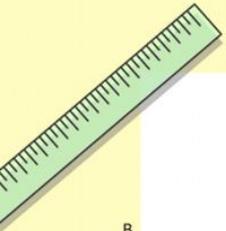
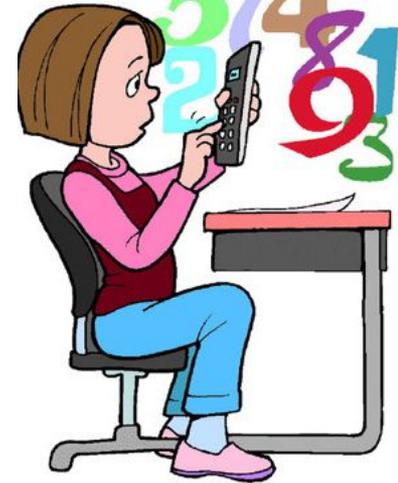
$$\begin{cases} x = 25 + 45 \\ x = 70 \end{cases}$$

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



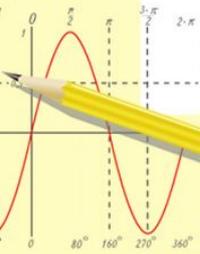
145-45-30:5=94

1. $145-45-(30:5)=94$
2. $(145-45)-30:5=94$
3. $(145-45)-(30:5)=94$
4. $145-(45-30:5)=106$
5. $(145-45-30):5=14$
6. $145-(45-(30:5))=106$
7. $((145-45)-30):5=14$
8. $145-(45-30):5=142$
9. $(145-(45-30)):5=26$
10. $145-((45-30):5)=142$



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

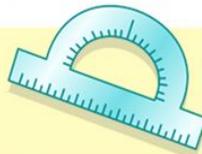
- $2 \times 2 = 4$
- $3 \times 3 = 9$
- $4 \times 4 = 16$
- $5 \times 5 = 25$
- $6 \times 6 = 36$
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$$\sin 90^\circ = 1$$

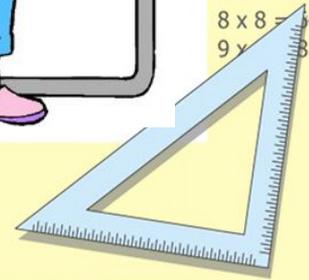


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

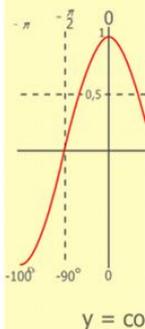
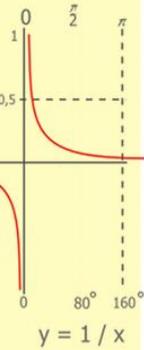
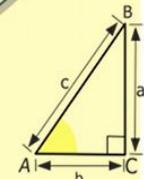
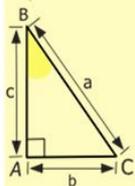
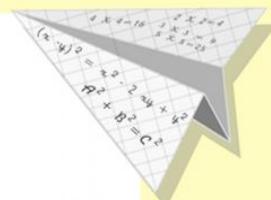
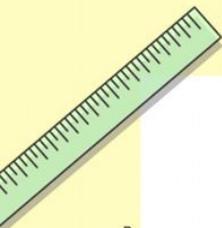
$$\begin{cases} y = 1 \\ x = 25 + 45 \end{cases}$$

$$x = 70$$

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

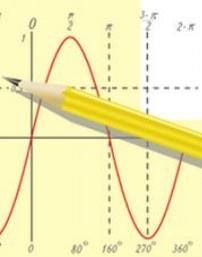


Гипотеза к Задаче-исследование № 2: при расстановке скобок не надо выделять скобками первое по порядку выполнения действие.



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

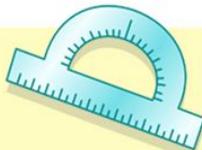
- 2 x 2 = 4
- 3 x 3 = 9
- 4 x 4 = 16
- 5 x 5 = 25
- 6 x 6 = 36
- 7 x 7 = 49
- 8 x 8 = 64
- 9 x 9 = 81



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

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

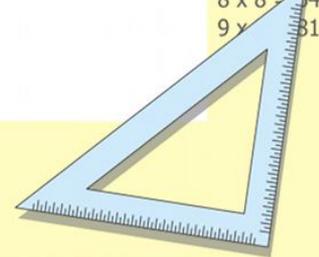
$$\sin 90^\circ = 1$$



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

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

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



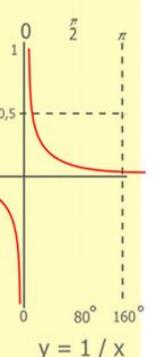
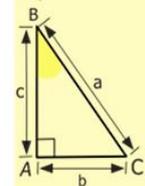
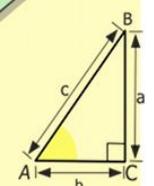
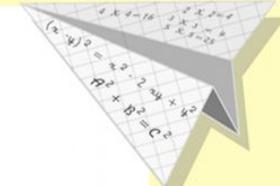
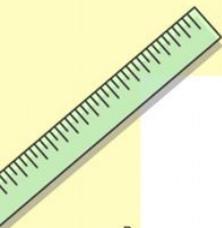
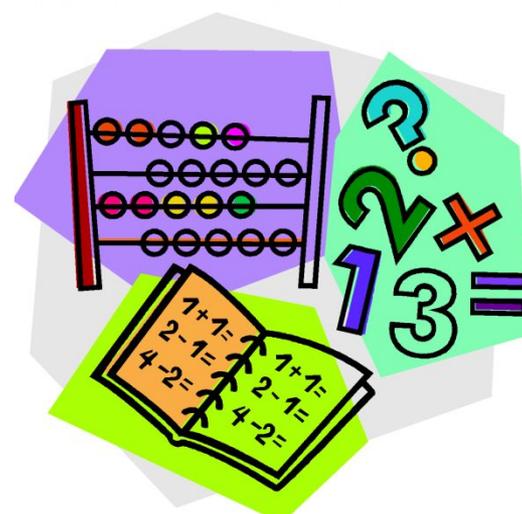
Упростите выражение, убрав скобки, которые можно не ставить, а затем найдите его значение:

а) $(12 \cdot 15) + (124 : 4)$;

б) $(36 + 15) - (75 - 39)$;

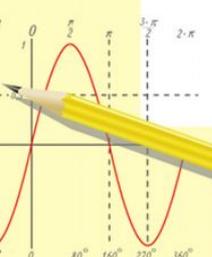
в) $120 - ((13 \cdot 4) + 8)$;

г) $((((144 - 10) - 10) - 10) - 10)$.



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

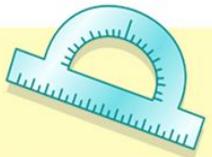
- 2 x 2 = 4
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$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

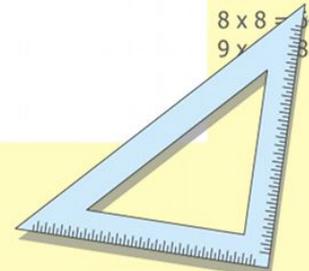


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

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

$$x = 70$$



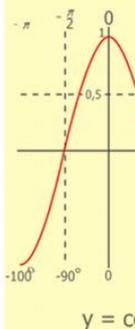
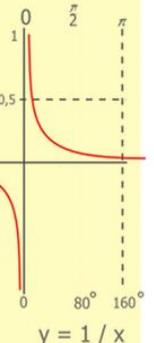
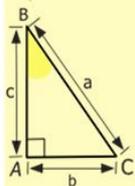
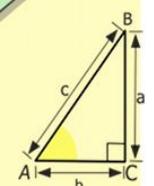
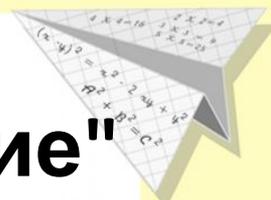
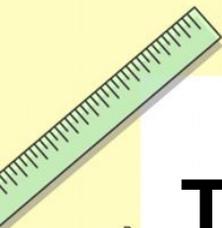
Тест по теме: "Числовые выражение"

1. Дано выражение $368 \cdot 26 - 46 : (2 + 11)$. Какое действие должно быть выполнено последним?

- 1) Умножение;
- 2) Деление;
- 3) Сложение;
- 4) Вычитание.

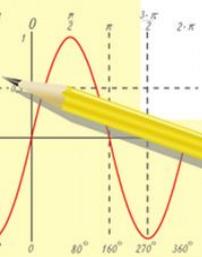
2. Вычислите: $(2489 + 622) - 389$.

- 1) 2522;
- 2) 2622;
- 3) 2722;
- 4) другой ответ.



$$\begin{array}{r} 2500 \\ \times 42 \\ \hline 2100 \\ + 840 \\ \hline 105000 \end{array}$$

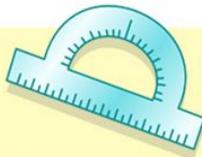
- $2 \times 2 = 4$
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- $4 \times 4 = 16$
- $5 \times 5 = 25$
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$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

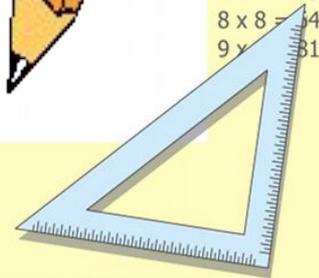
$$\sin 90^\circ = 1$$



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

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

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



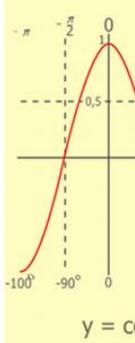
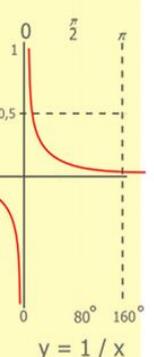
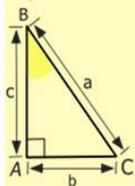
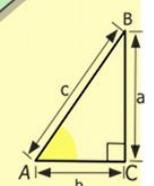
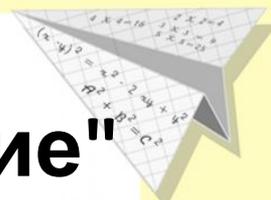
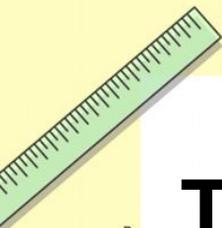
Тест по теме: "Числовые выражение"

3. Вычислите: $230 - (456 : 6 + 6)$.

- 1) 192; 2) 160;
3) 148; 4) другой ответ.

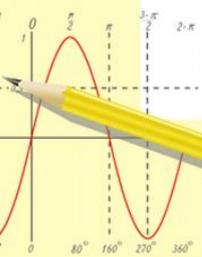
4. Среди числовых выражений, выберите то выражение, в котором можно убрать лишние скобки:

- 1) $2346 : (209 - 186) \cdot 15$; 2) $703 - 21 \cdot (361 - 349)$;
3) $(33 \cdot 152) + (124 - 48)$; 4) $77 \cdot (452 - 348) - 99$.



$$\begin{array}{r} 1\ 2\ 5\ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105\ 000 \end{array}$$

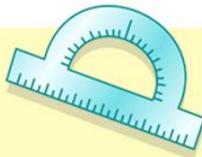
- 2 x 2 = 4
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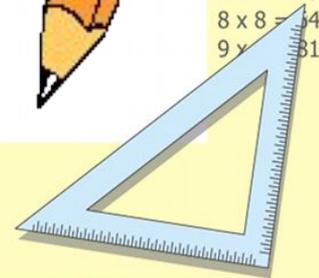
$$\sin 90^\circ = 1$$



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

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

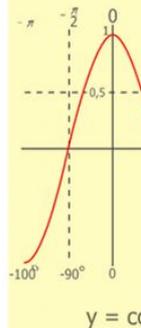
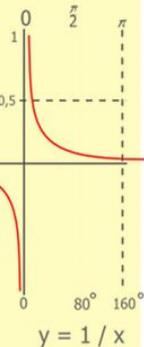
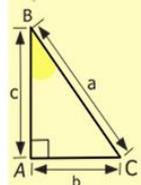
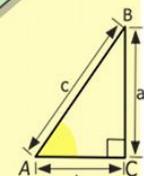
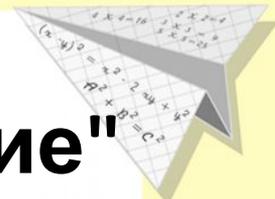
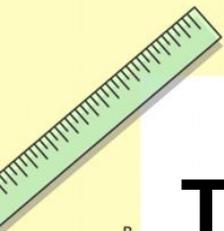
$$(x+y)(x-y) = x^2 - y^2$$



Тест по теме: "Числовые выражение"

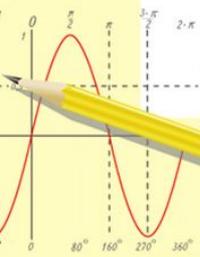
5. Какой общий множитель можно вынести за скобки в выражении $52 \cdot 42 + 42 \cdot 143$?

- 1) 42;
- 2) 57;
- 3) 143;
- 4) другой ответ.



$$\begin{array}{r} 1 \ 2 \ 5 \ 00 \\ \times 42 \\ \hline 210 \\ + 840 \\ \hline 105000 \end{array}$$

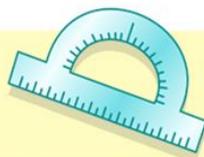
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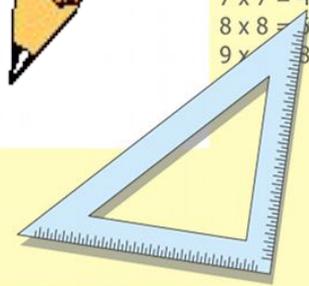
$$\sin 90^\circ = 1$$



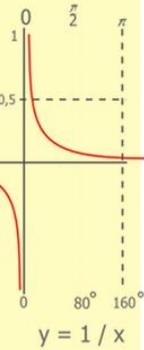
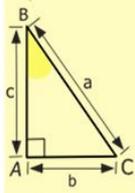
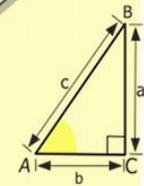
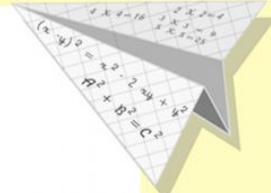
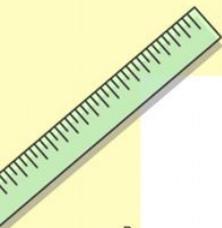
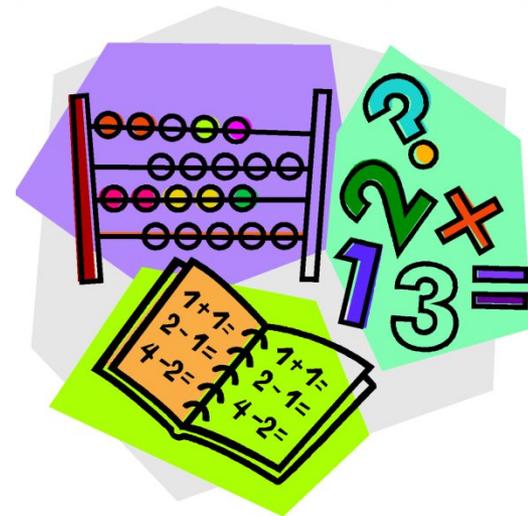
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

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

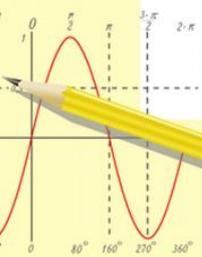


Спасибо за внимание!



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

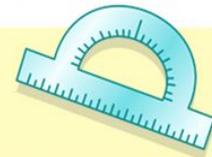
- $2 \times 2 = 4$
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$$\sin 90^\circ = 1$$



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

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

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

