

# Математика

## Тема урока: «Одночлены. Многочлены.»

Учитель  
математики  
ГБОУ СОШ № 619  
г.Москвы  
Рудьман Т.В.

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

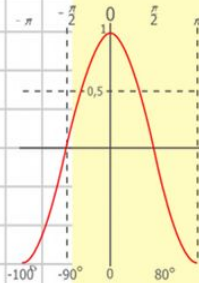
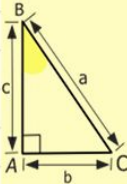
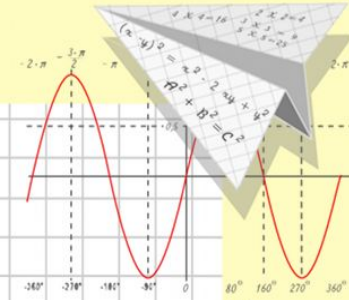
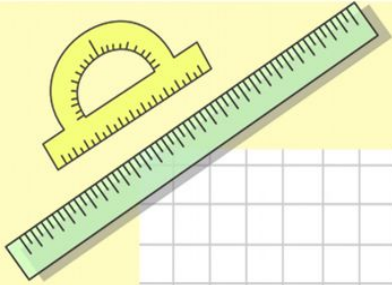
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

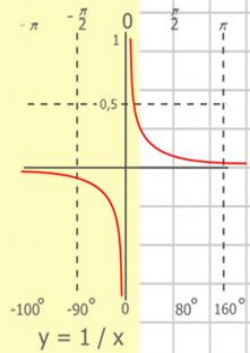
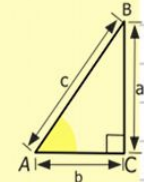
$$\begin{aligned} y &= \sin 90 \\ x &= 25y + 45 \\ y &= \dots \\ x &= 25 + 45 \\ x &= 70 \end{aligned}$$

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

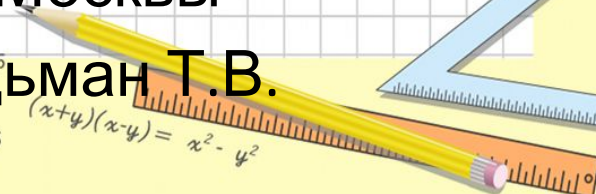
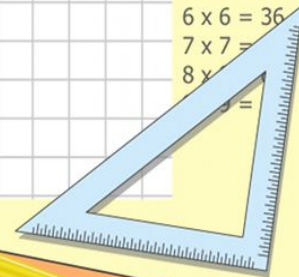
$$\begin{aligned} 2 \times 2 &= 4 \\ 3 \times 3 &= 9 \\ 4 \times 4 &= 16 \\ 5 \times 5 &= 25 \\ 6 \times 6 &= 36 \\ 7 \times 7 &= 49 \\ 8 \times 8 &= 64 \end{aligned}$$



$$y = \cos x$$



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



# Определение одночлена

Одночленом называется выражение, которое содержит числа, натуральные степени переменных и их произведения, и при этом не содержит никаких других действий с этими числами и переменными.

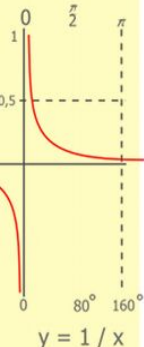
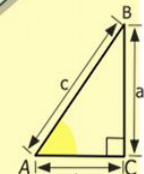
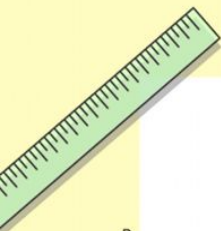
*Среди перечисленных выражений на экране назовите одночлены:*

$$4bc$$

$$a + b$$

$$3c^2x^5$$

$$\frac{d}{a}$$



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



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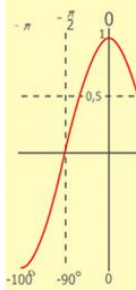
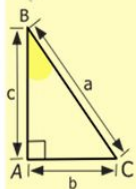
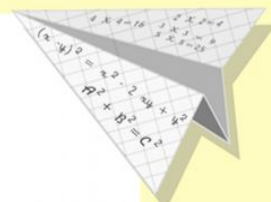
$$\sin 90^\circ = 1$$



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

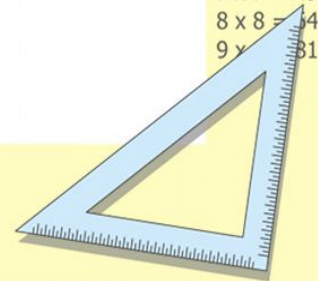
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



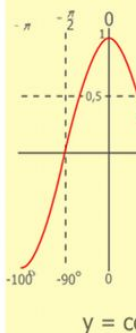
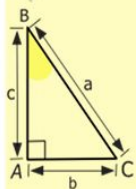
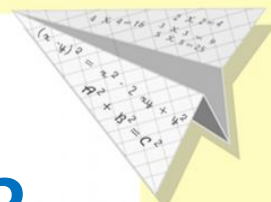
$$y = \cos$$

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- $9 \times 9 = 81$



# Какое определение неверное?

- ❖ В результате умножения одночлена на одночлен получается одночлен
- ❖ Одночленом называют сумму числовых и буквенных множителей
- ❖ Числовой множитель у одночлена стандартного вида называется коэффициентом одночлена



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

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



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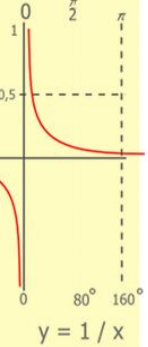
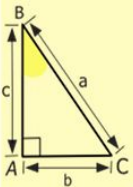
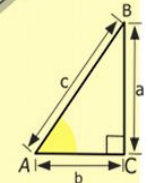
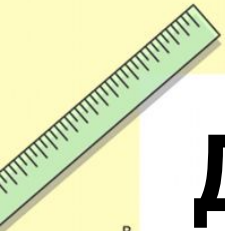
# Действия над одночленами

Записать одночлен в стандартном виде.

$$3,2a \times 0,25ab$$

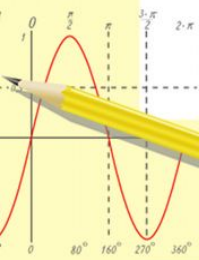
Проверяем

$$0,8a^2b$$



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

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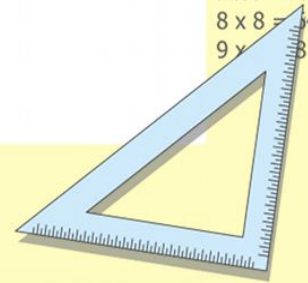
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$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



Найдите значение одночлена  $2x^3x$   
при  $x = -3$

Проверяем

162

Выполнить умножение одночленов

$$2mn \times (-4m^2n^2)$$

Проверяем

$$-8m^3n^3$$

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

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

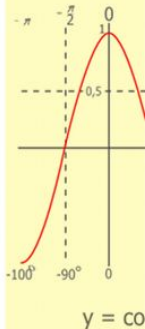
$$x = 70$$

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

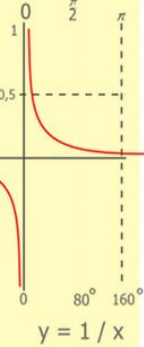
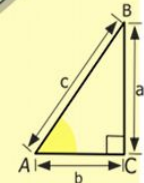
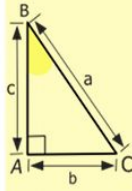
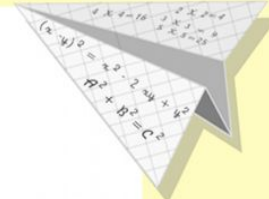
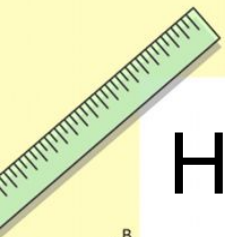
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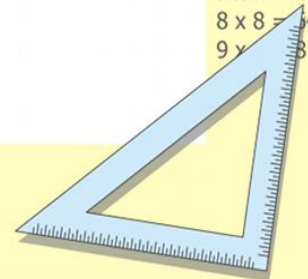
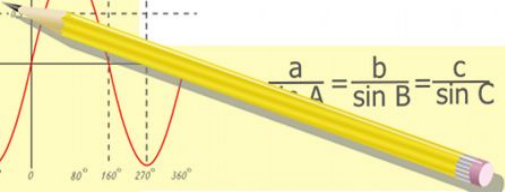
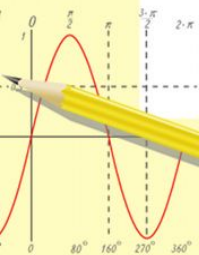
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$



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Возведите одночлен в степень  $(10x^3y^2a^2)^3$

Проверяем

$$-10000x^9y^6a^6$$

Записать выражение в виде квадрата  
одночлена  $9a^6$

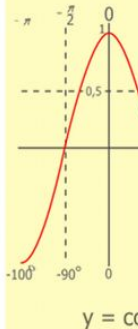
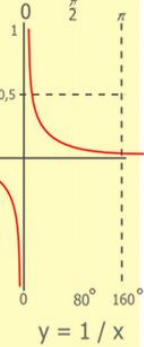
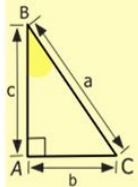
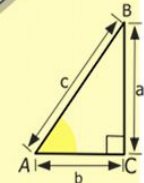
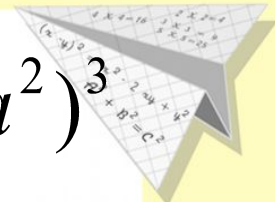
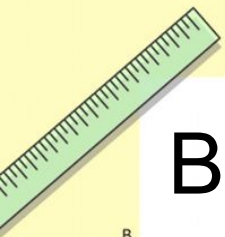
Проверяем

$$(3a^3)^2$$

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

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

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



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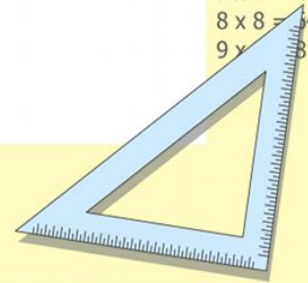
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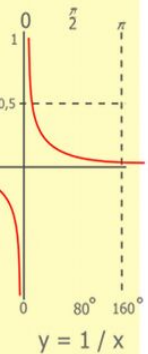
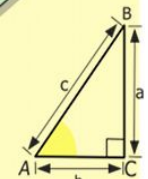
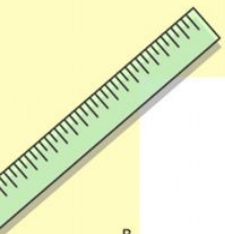


# Определение многочлена

Многочленом называется сумма одночленов. Если все одночлены в многочлене приведены к стандартному виду, то говорят, что это многочлен стандартного вида.

*Среди перечисленных выражений на экране назовите многочлены:*

$$(2a^2)^3 \quad 4a^2 - 3fc^3 \quad 4ac^2 \quad 2a^2 - (2bc + 2c^2)^3$$



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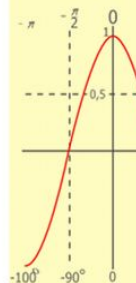
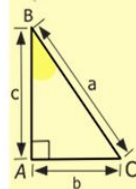
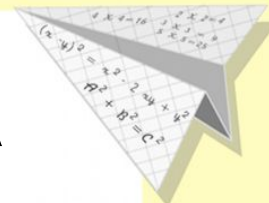


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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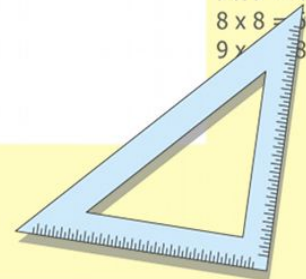
$$x = 70$$

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



$$y = \cos$$

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# Соединить линиями соответствующие части определений.

В результате умножения  
многочлена на  
многочлен

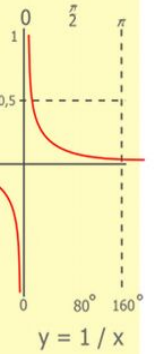
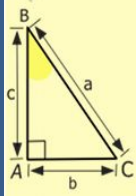
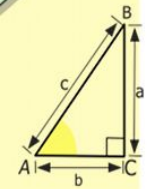
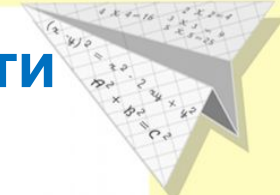
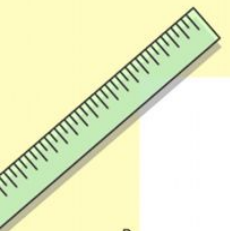
показатели степеней  
складываются

При умножении степеней  
с одинаковыми  
основаниями

отдельно ее числитель и  
знаменатель

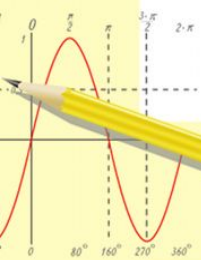
При возведении в  
степень дроби возводят в  
эту степень

получается многочлен



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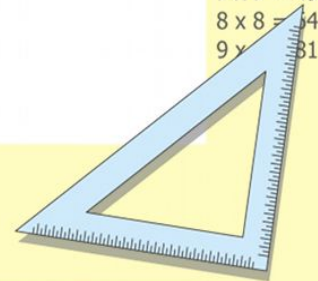
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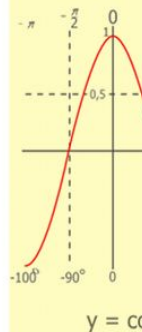
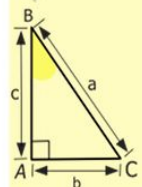
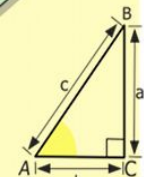
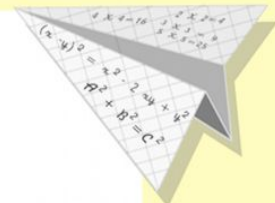
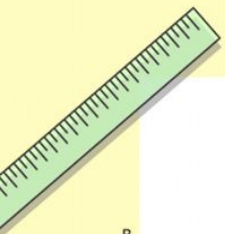




# Действия над многочленами

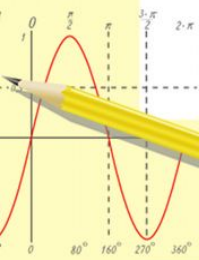
Преобразовать сумму и разность  
многочленов в многочлен  
стандартного вида –  $(21x^2 - 4ax + 7x)$

Проверяем  
 $-9x^2 - 4ax + x$



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

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



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

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

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

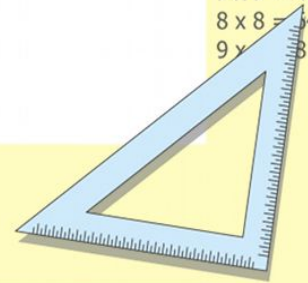


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

$$x = 70$$

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



Умножить многочлен на одночлен,  
 преобразовать  $(-4by^2 - 3b^2y^2 - 4by^3 - 5y^3) \times (-4by)$

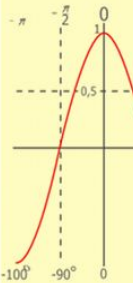
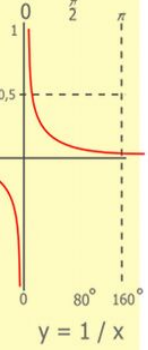
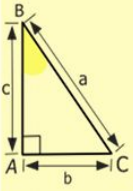
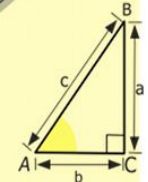
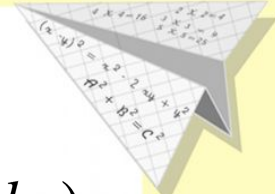
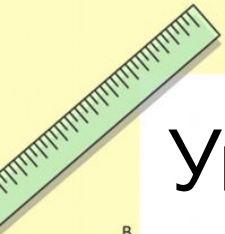
**Проверяем**

$$12b^3y^3 + 16b^2y^4 + 16b^2y^3 + 20by^4$$

Преобразовать выражение в многочлен  
 стандартного вида  $-3a^2 \times (-2a^3 + 9a) + (-7a^2 + 2) \times (-2a^3)$

**Проверяем**

$$20a^5 - 31a^3$$



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

y = cos

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



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

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

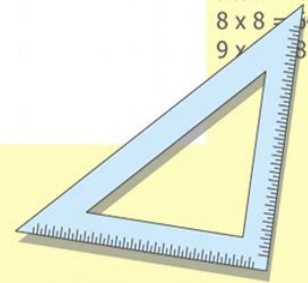


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

$$x = 70$$

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



# Вспоминаем формулы

## сокращенного умножения:

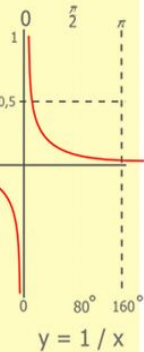
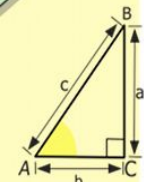
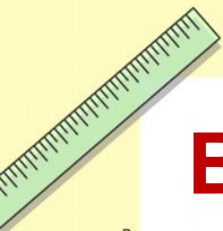
$$a^2 - b^2 = (a - b) \times (a + b)$$

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

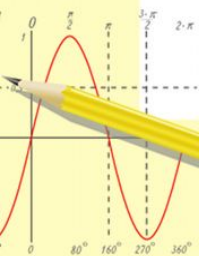
$$(a + b)^2 = a^2 + 2ab + b^2$$

$$a^3 + b^3 = (a + b) \times (a^2 - ab + b^2)$$

$$a^3 - b^3 = (a - b) \times (a^2 + ab + b^2)$$



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



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

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

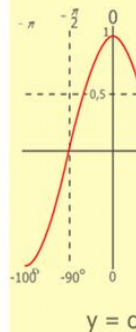
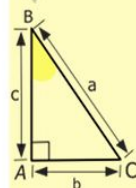
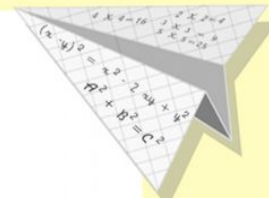
$$\sin 90^\circ = 1$$



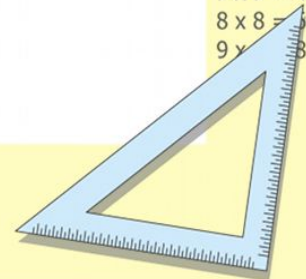
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

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



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

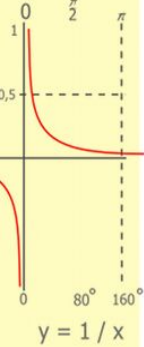
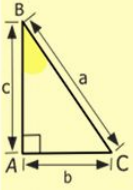
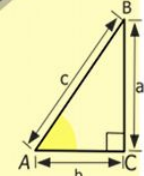
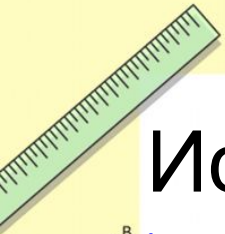


# Используемые ресурсы:

[http://ucheba-legko.ru/lections/viewlection/matematika/7\\_klass/mnogochlenyi/odnochlenyi](http://ucheba-legko.ru/lections/viewlection/matematika/7_klass/mnogochlenyi/odnochlenyi)

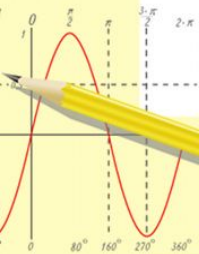
[http://ucheba-legko.ru/lections/viewlection/matematika/7\\_klass/mnogochlenyi/lec\\_odnochl\\_enyi\\_i\\_mnogochlenyi-2](http://ucheba-legko.ru/lections/viewlection/matematika/7_klass/mnogochlenyi/lec_odnochl_enyi_i_mnogochlenyi-2)

[http://fizmat.by/math/polynomials/operations\\_monomials/test25](http://fizmat.by/math/polynomials/operations_monomials/test25)



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

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