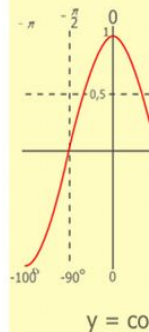
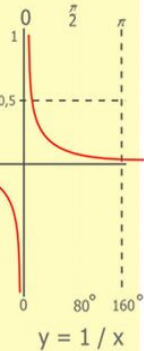
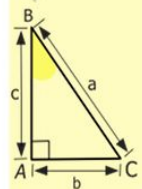
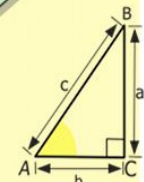
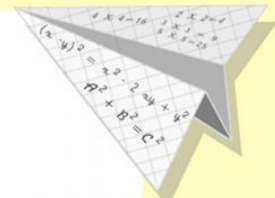
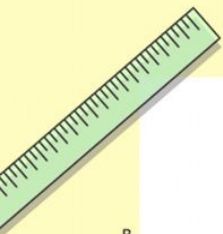


Тема уроку:

Показникова функція, її графік і властивості.



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

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



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

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

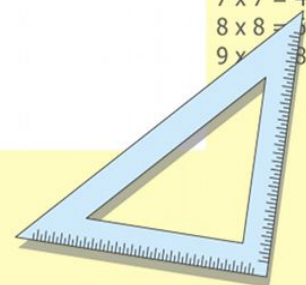
$$\sin 90^\circ = 1$$



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

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

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



Знайди пари

$$\left(\frac{1}{2}\right)^x = \frac{1}{32}$$

Розв'язків
немає

$$2^x = -4$$

3

$$0,5^x = 0,25$$

2

$$7^x = 1$$

5

$$5^x = 125$$

0



Радіоактивний розпад

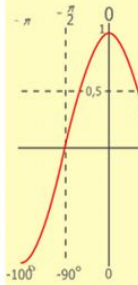
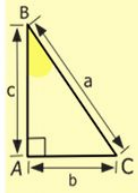
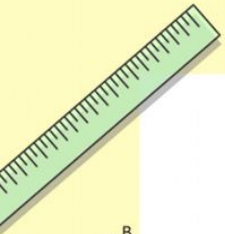
kt

$$m = m_0 a$$

Назвіть функцію.

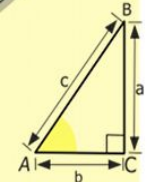


Під час радіоактивного розпаду маса m речовини змінюється на протязі часу t по закону: $m = m_0 a^{kt}$, где m — маса речовини через t років після початку розпаду; m_0 — початкова маса речовини; k и a — постійні величини для даної речовини.



$y = \cos$

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



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



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

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

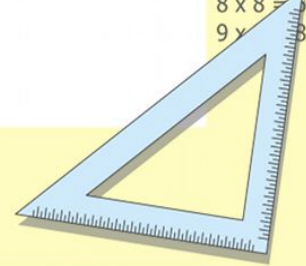
$$\sin 90^\circ = 1$$



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

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

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



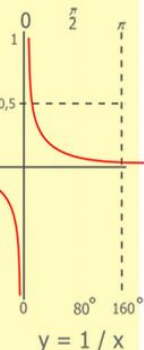
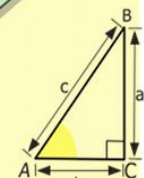
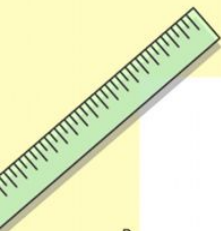
Приріст населення

$$y = 1\,000\,000 \cdot 1,02^x$$

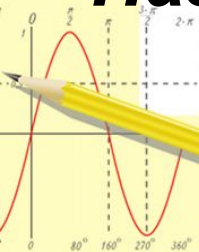
- Кількість y жителів міста з мільйонним населенням через x років обчислюється за формулою $y = 1\,000\,000 \cdot 1,02^x$ (при умові, що кожного року спостерігається приріст населення на 2%).



Назвіть функцію



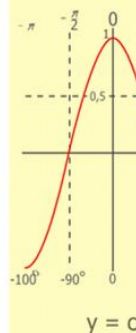
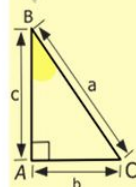
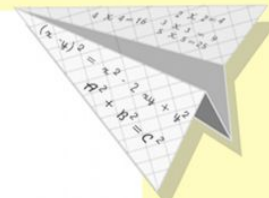
$$\begin{array}{r} 1\ 2\ 5\ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105\ 000 \end{array}$$



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

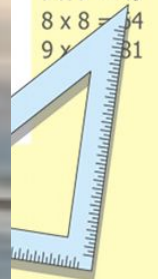
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

sin 90



y = cos

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

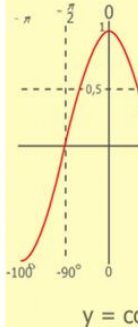
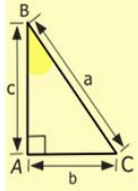
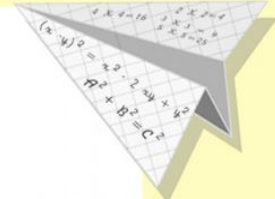
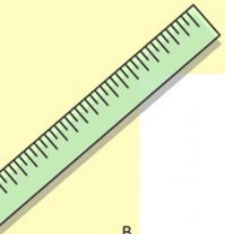


Зміна температури

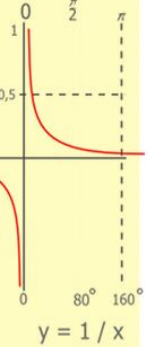
$$T = 100 \cdot 0,8^t$$

Температура T 100 г піску, нагрітого до 100°C , змінюється при 0°C в залежності від часу t за формулою: $T = 100 \cdot 0,8^t$.

Назвіть функцію.



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



$$\begin{array}{r} 1 \ 5 \ 00 \\ \times 4 \ 2 \\ \hline 2 \ 1 \ 0 \\ + 8 \ 4 \\ \hline 105 \ 0 \ 00 \end{array}$$



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

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

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

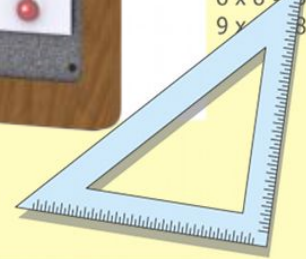


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

$$x = 70$$

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

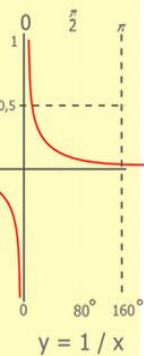
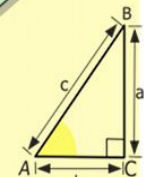
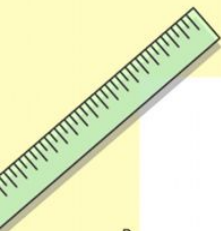
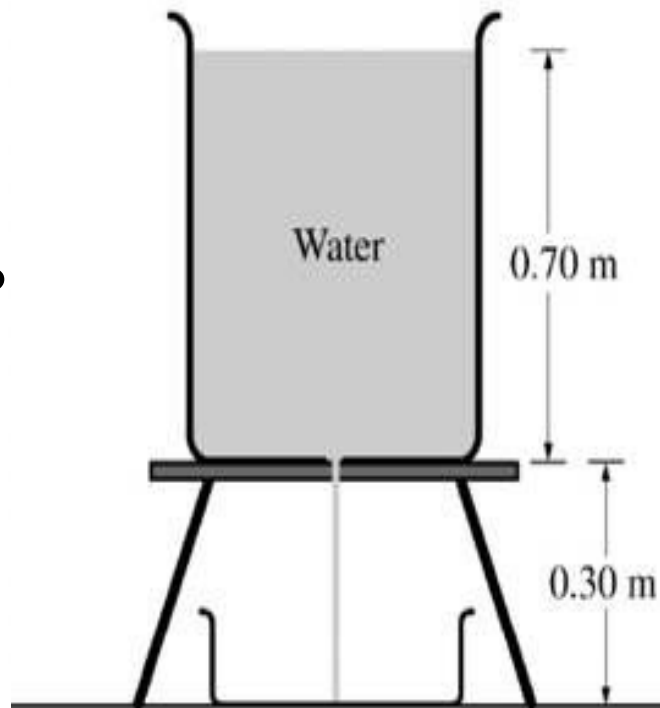


Витікання рідини із циліндричної посудини через тонку трубку

$$h = h_0 a^t,$$

де h_0 — початковий рівень рідини ; a — постійна , яка залежить від діаметру трубки.

Назвіть функцію



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



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

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

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

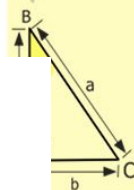
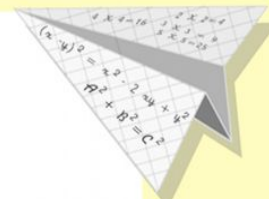


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

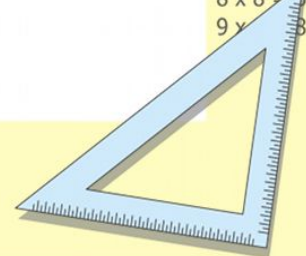
$$(x+y)(x-y) = x^2 - y^2$$

$$x = 70$$



$$y = \cos$$

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

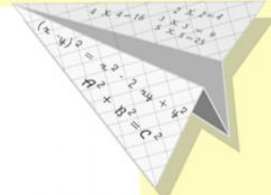
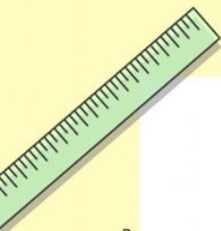


Зміна атмосферного тиску

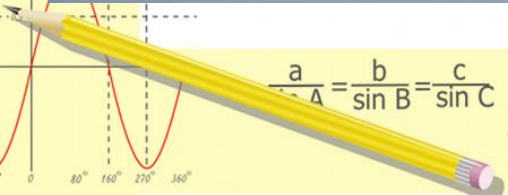


$p = p_0 a^h$
 Атмосферний тиск змінюється
 в залежності від висоти h над рівнем моря
 за законом $p = p_0 a^h$
 де p_0 — атмосферний тиск
 над рівнем моря;
 a — постійна величина.

Назвіть функцію



- 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



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

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

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

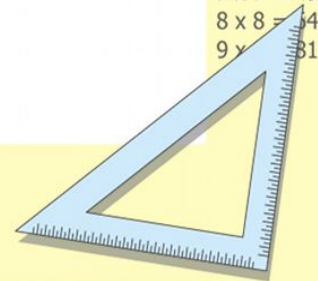


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

$$x = 70$$

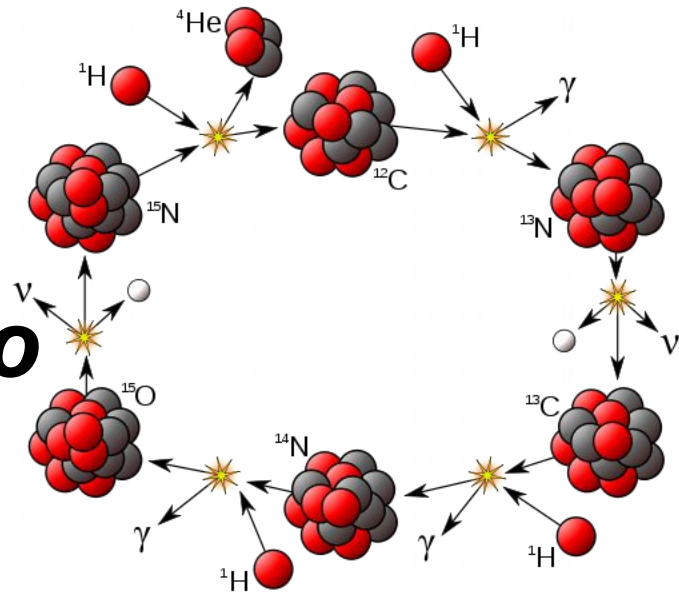
$$(x+y)(x-y) = x^2 - y^2$$



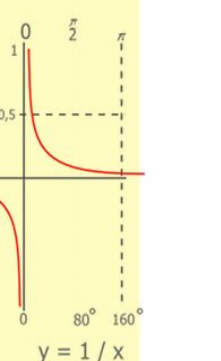
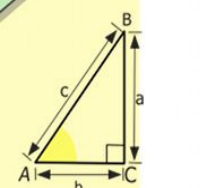
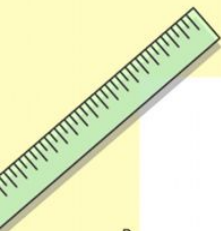
Розмноження бактерій

$$N = N_0 a^{kt}$$

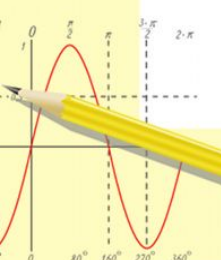
Назвіть функцію



	Proton	γ	Gamma Ray
	Neutron	ν	Neutrino
	Positron		



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



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

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

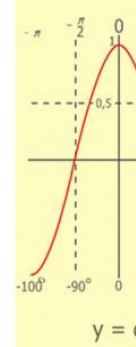
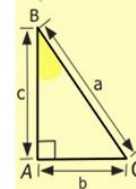
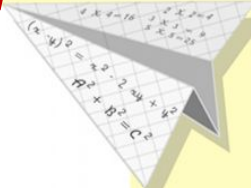
$$\sin 90^\circ = 1$$



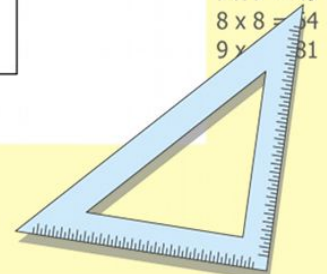
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

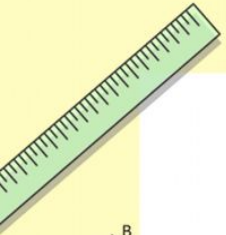
$$(x+y)(x-y) = x^2 - y^2$$



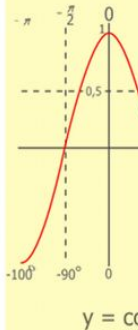
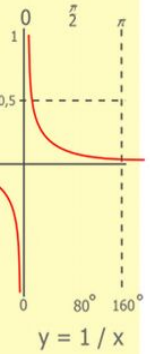
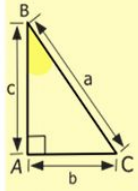
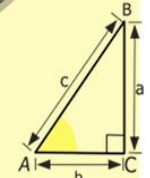
- 2 x 2 = 4
- 3 x 3 = 9
- 4 x 4 = 16
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- 8 x 8 = 64
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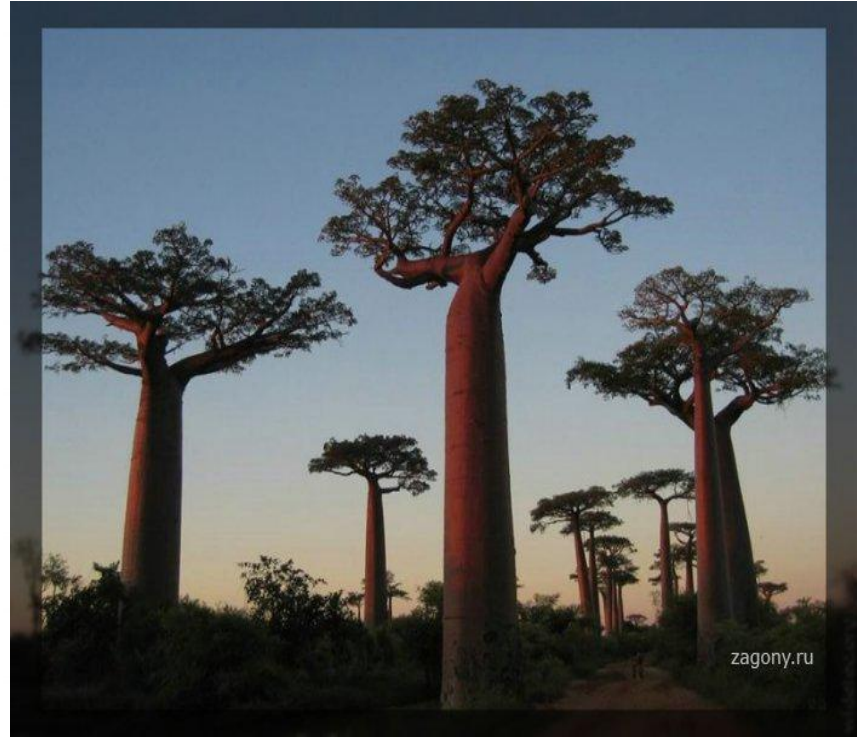
Приріст деревини



$$M = M_0 a^{kt}$$



Назвіть функцію



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

- 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



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

$\sin 90^\circ = 1$

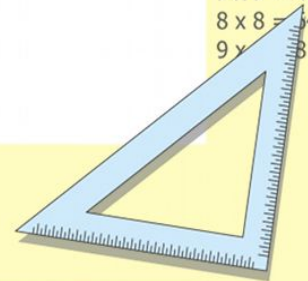


$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

$$x = 70$$

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



Визначте, що є спільного в даних формулах?

$$m = m_0 a^{kx}$$

$$h = h_0 a^t$$

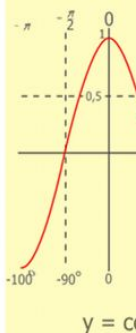
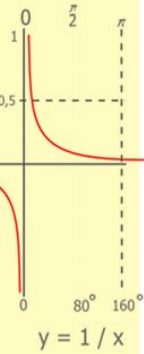
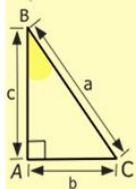
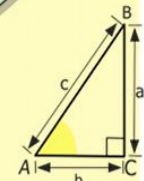
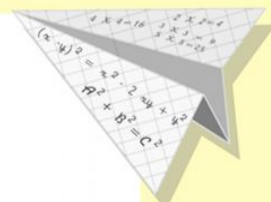
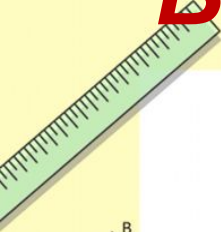
$$y = 1000000 \cdot 1,02^x$$

$$p = p_0 a^h$$

$$T = 100 \cdot 0,8^t$$

$$N = N_0 a^{kt}$$

$$M = M_0 a^{kt}$$



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

$2 \times 2 = 4$
 $3 \times 3 = 9$
 $4 \times 4 = 16$
 $5 \times 5 = 25$
 $6 \times 6 = 36$
 $7 \times 7 = 49$
 $8 \times 8 = 64$
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$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

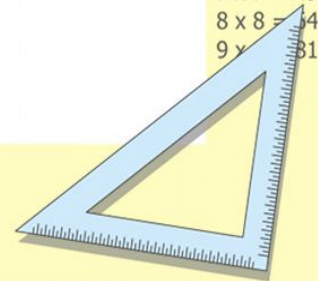
$$\sin 90^\circ = 1$$



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

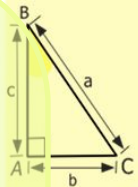
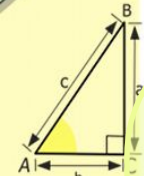
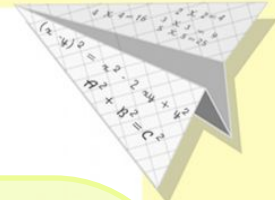
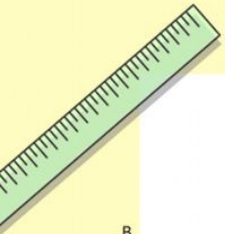
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



Означення:

Функція, задана формулою $y = a^x$ (де $a > 0$, $a \neq 1$), називається показниковою функцією з основою a



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

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



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

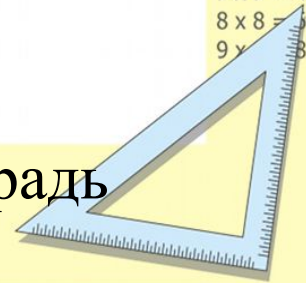
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

Запишіть определение в тетрадь



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

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

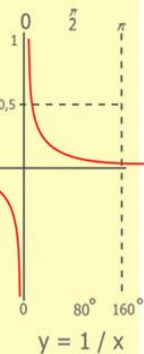
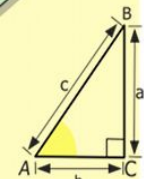
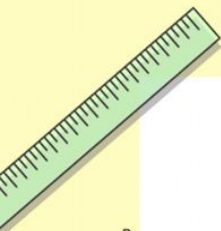


Побудова графіків показникових функцій

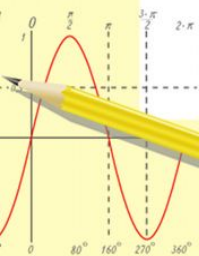
1) $a > 1$

2) $0 < a < 1$

Приклади :



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



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

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

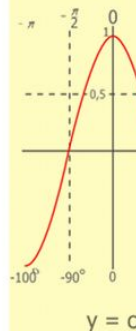
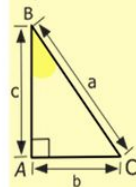
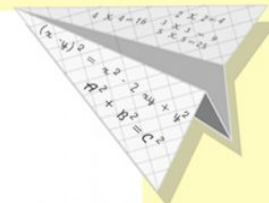
$$\sin 90^\circ = 1$$



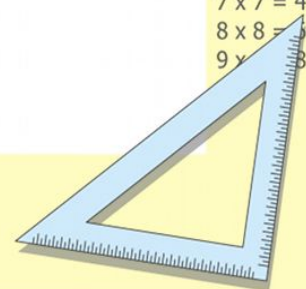
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

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



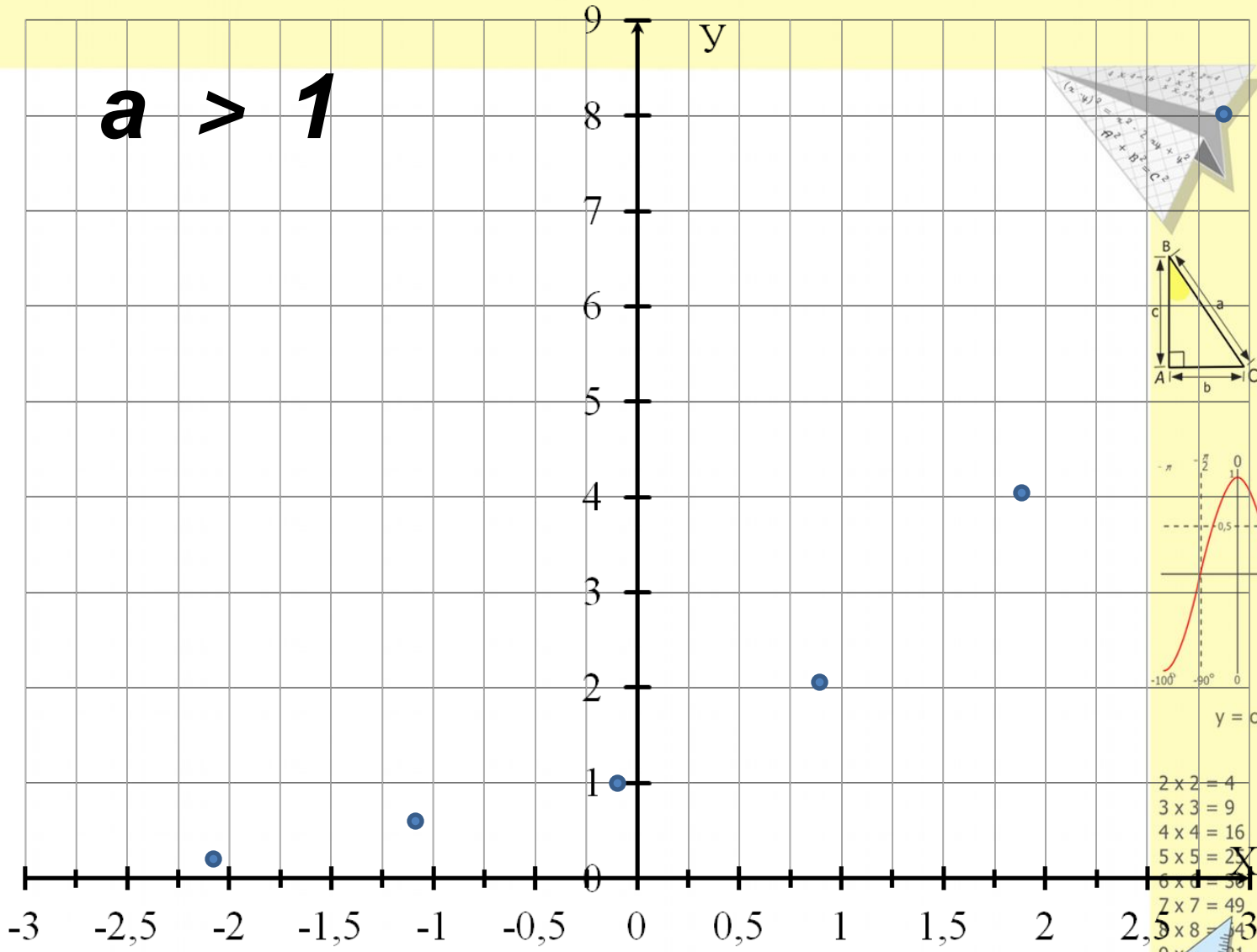
$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



$$y=2^x$$

$$a > 1$$

X	y
-2	$\frac{1}{4}$
-1	$\frac{1}{2}$
0	1
1	2
2	4
3	8



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

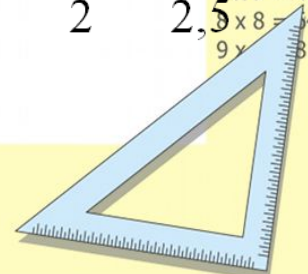
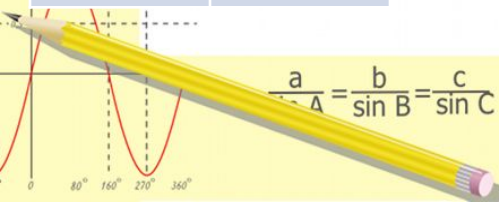
$$\frac{a}{c} + \frac{b}{c} = \frac{a+b}{c}$$

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

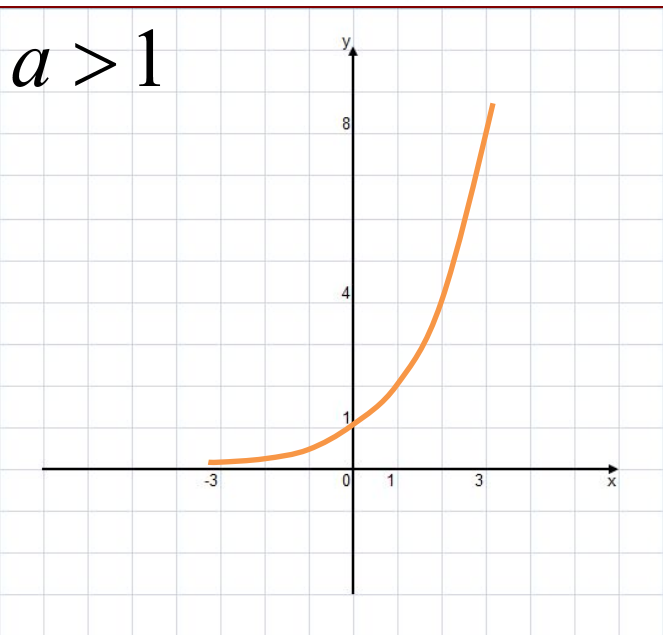
$$\begin{cases} y = \sin 90 \\ x = 25y + 45 \end{cases}$$

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

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

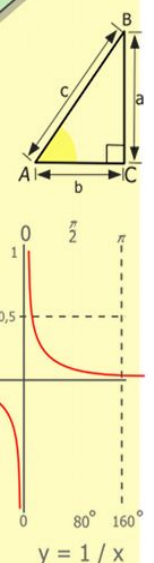


Графік показникової функції



Властивості:

- 1) $D(y) = \mathbb{R}$;
- 2) $E(y) = (0; \infty)$;
- 3) Функція зростає при $x \in \mathbb{R}$;
- 4) Графік функції перетинає Oy в точці $(0; 1)$



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



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

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

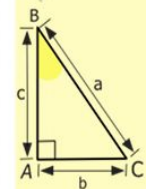
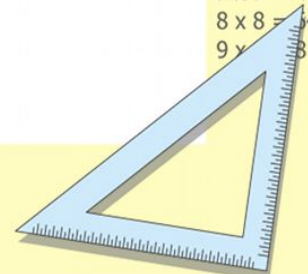
$\sin 90^\circ = 1$



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

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

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



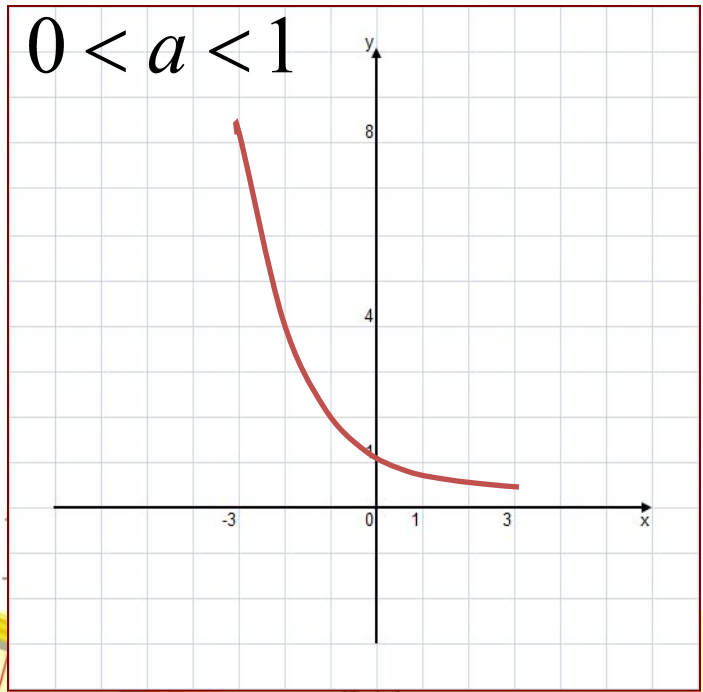
2 x 2 =	4
3 x 3 =	9
4 x 4 =	16
5 x 5 =	25
6 x 6 =	36
7 x 7 =	49
8 x 8 =	64
9 x 9 =	81

функції

$$y = \left(\frac{1}{2}\right)^x$$

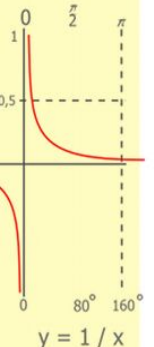
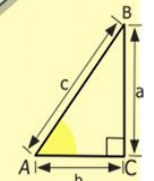
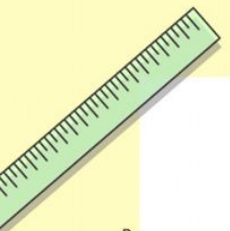
$$0 < a < 1$$

x	-3	-2	-1	0	1	2	3
$y = \left(\frac{1}{2}\right)^x$	8	4	2	1	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{8}$

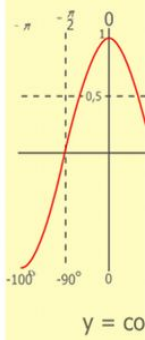
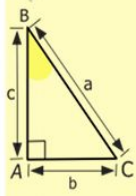
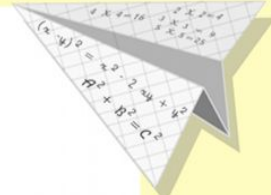
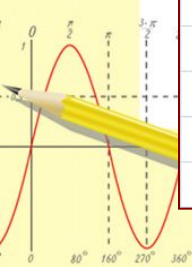


Властивості:

- 1) $D(y) = \mathbb{R}$;
- 2) $E(y) = (0; \infty)$;
- 3) Функція спадає при $x \in \mathbb{R}$;
- 4) Графік ф-ції перетинає Oy в точці $(0, 1)$



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

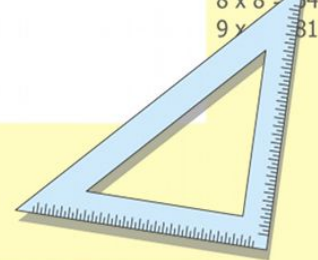


$$\begin{array}{l} 2 \times 2 = 4 \\ 3 \times 3 = 9 \\ 4 \times 4 = 16 \\ 5 \times 5 = 25 \\ 6 \times 6 = 36 \\ 7 \times 7 = 49 \\ 8 \times 8 = 64 \\ 9 \times 9 = 81 \end{array}$$



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

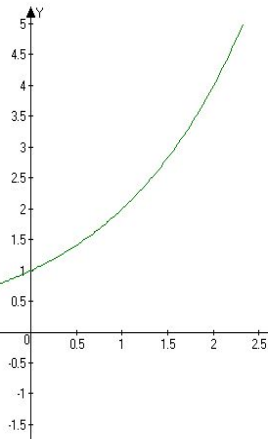
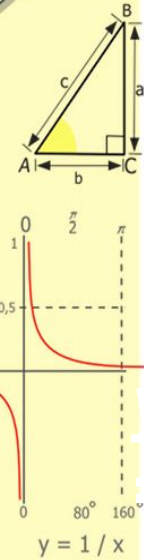
$$(x+y)(x-y) = x^2 - y^2$$



Підведення підсумків з вивчення властивостей графіків показникових функцій

1) $a > 1$

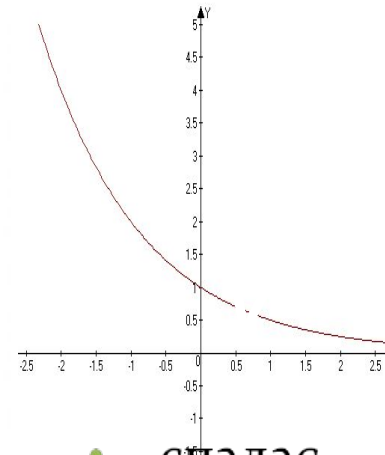
2) $0 < a < 1$



• зростає

$$x_1 > x_2 \Leftrightarrow a^{x_1} > a^{x_2};$$

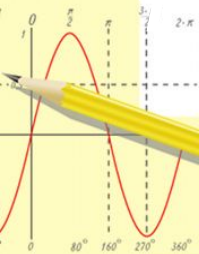
- $D(y) = R$;
- $E(y) = (0; \infty)$;
- якщо $x=0$, то $y=1$;



• спадає

$$x_1 > x_2 \Leftrightarrow a^{x_1} < a^{x_2};$$

Графік показникової функції називається експонентою.



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

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

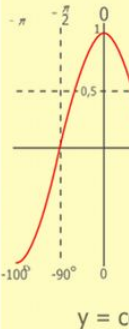
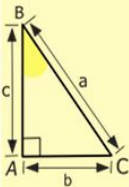
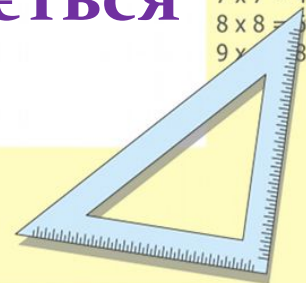
$$\sin 90^\circ = 1$$



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

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

$a <$



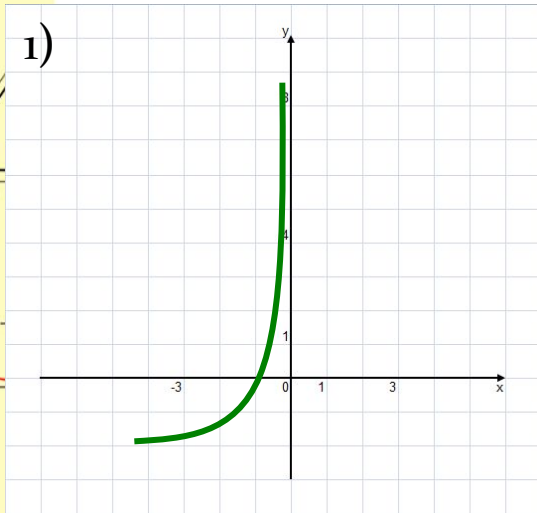
$y = \cos$

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

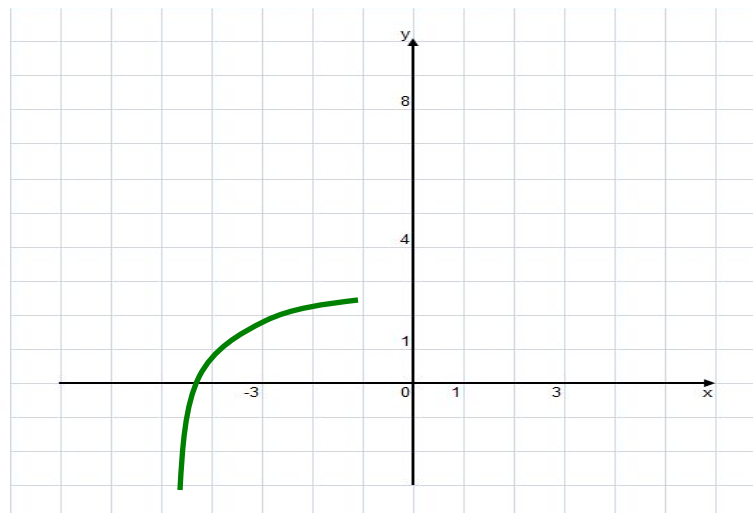
$$\begin{array}{r} 1 \\ 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$$

Які з графіків є графіками показникової функції:

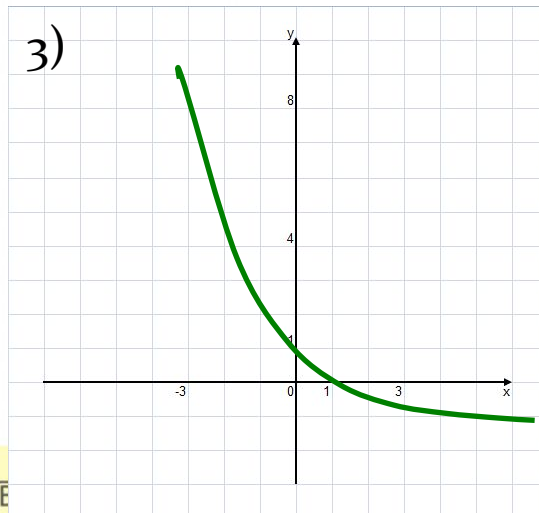
1)



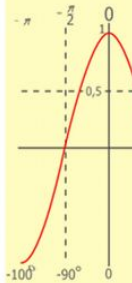
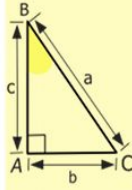
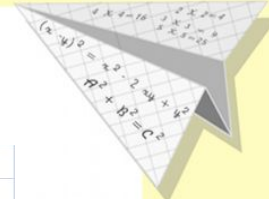
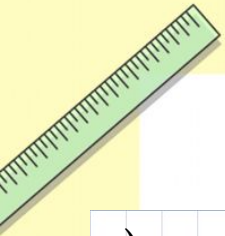
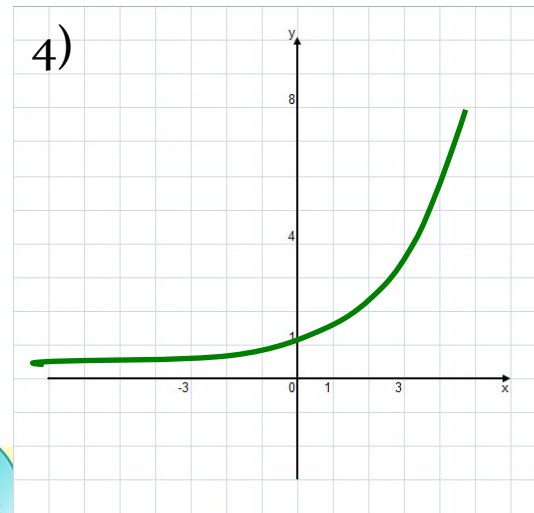
2)



3)



4)



$y = \cos$

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



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



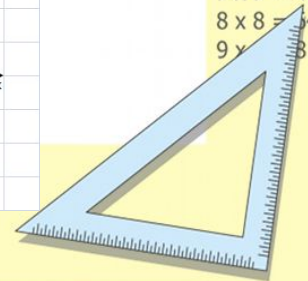
$$\frac{a}{c} = \frac{b}{\sin A}$$

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

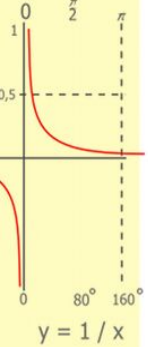
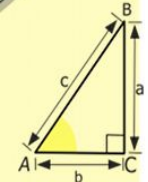
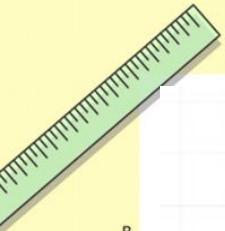
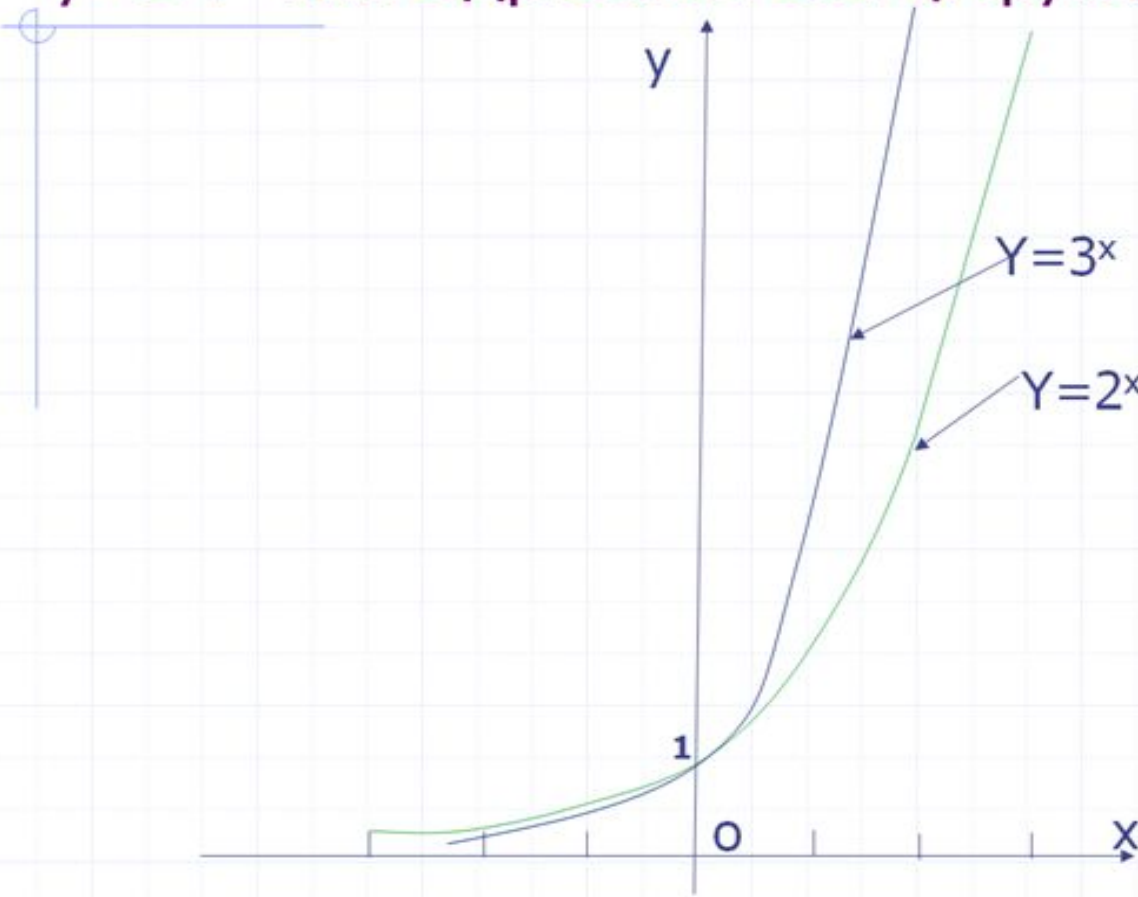


$$\frac{x=25+45}{x=70}$$

$$(x-y)^2 = x^2 - 4y^2$$



Розглянути графіки функцій $y=2^x$ і $y=3^x$. Чим відрізняються ці функції?



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



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

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

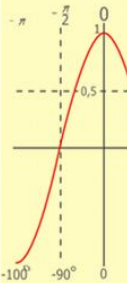
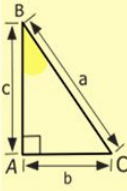
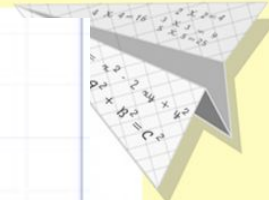
$$\sin 90^\circ = 1$$



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

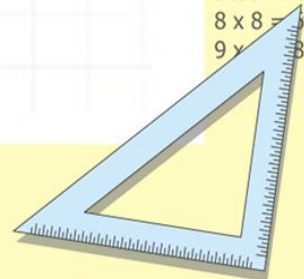
$$\begin{cases} y = 1 \\ x = 25 + 45 \\ \hline x = 70 \end{cases}$$

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



$$y = \cos$$

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



Тренувальна вправа

Серед наведених функцій вибрати ті, що **спадають**.

$$y = (4,8)^x$$

$$y = (\sqrt{3})^x$$

$$y = (0,001)^x$$

$$y = \left(\frac{1}{9}\right)^x$$

$$y = (\pi + 1)^x$$

$$y = \left(\frac{4}{3}\right)^x$$

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

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

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

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

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

$$x = 70$$

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

Тренувальна вправа

Серед наведених функцій вибрати ті, що **зростають**.

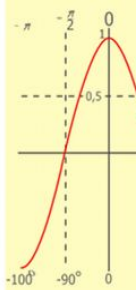
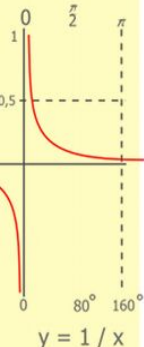
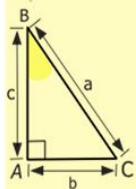
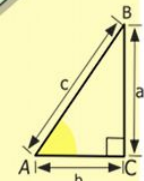
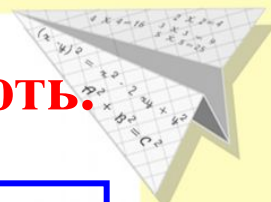
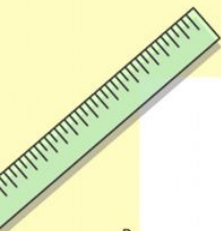
$$y = \left(\frac{1}{\sqrt{3}} \right)^x$$

$$y = \left(\frac{3}{\pi} \right)^x$$

$$y = (0,01)^x$$

$$y = \left(\frac{\pi}{3} \right)^x$$

$$y = \left(\frac{1}{9} \right)^x$$



$\frac{1}{2} \begin{array}{r} 2500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 10500 \end{array}$

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



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

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

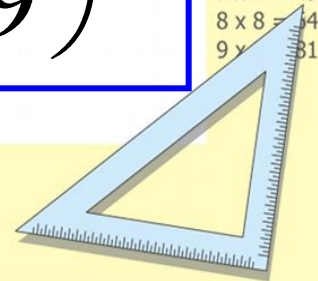
$$\sin 90^\circ = 1$$



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

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

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



Застосування властивостей

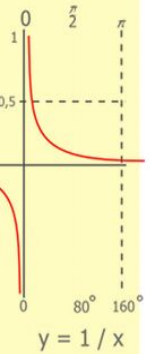
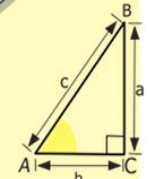
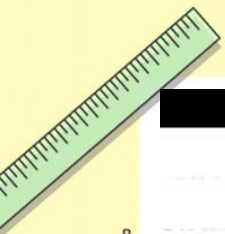
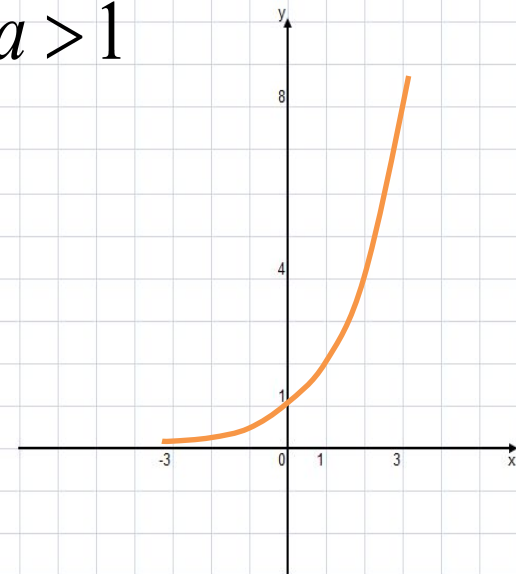
Порівняйте значення виразів

$$2^{\sqrt{3}} < 2^{\sqrt{5}}$$

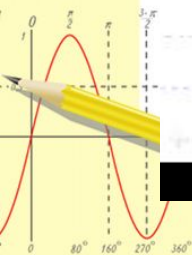
$$2^{-3} > 2^{-4}$$

$$2^{-\sqrt{2}} > 2^{-\sqrt{3}}$$

$$a > 1$$

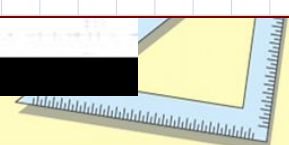


$$\begin{array}{r} 12500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

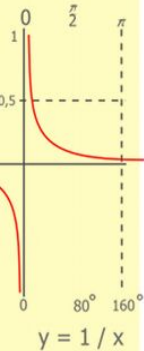
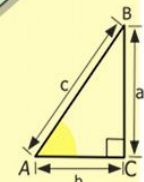
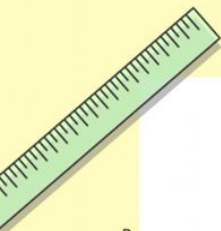


$$\frac{x = 25 \pm 45}{x = 70}$$

$$x^2 - 4^2$$



Застосування властивостей



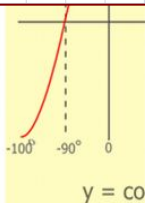
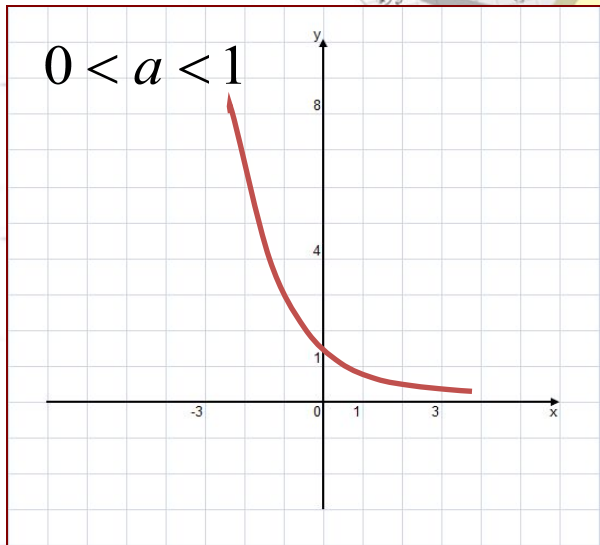
$$\begin{array}{r} 12500 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$



$$\left(\frac{1}{2}\right)^{\frac{2}{7}} < \left(\frac{1}{2}\right)^{0,3}$$

$$\left(\frac{1}{2}\right)^{\frac{1}{2}} > \left(\frac{1}{2}\right)^{\frac{1}{\pi}}$$

$$\left(\frac{1}{2}\right)^3 > \left(\frac{1}{2}\right)^{\pi}$$



- $2 \times 2 = 4$
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- $5 \times 5 = 25$
- $6 \times 6 = 36$
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$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

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

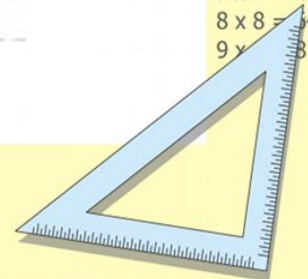
$$\sin 90^\circ = 1$$



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

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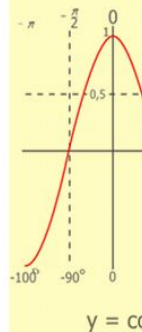
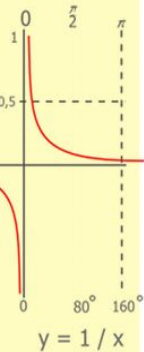
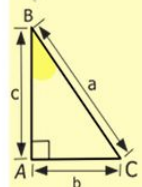
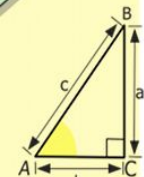
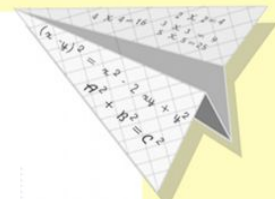
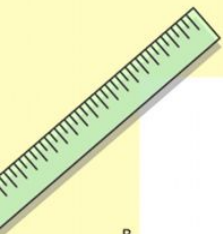


Застосування властивостей

Порівняйте основу $a > 0$ з одиницею, якщо відома нерівність.

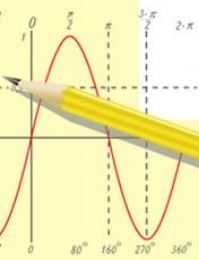
$$a^{10} < a^{15}$$

$$a > 1$$



$$\begin{array}{r} 1 \ 5 \ 00 \\ \times 42 \\ \hline 210 \\ + 84 \\ \hline 105000 \end{array}$$

- $2 \times 2 = 4$
- $3 \times 3 = 9$
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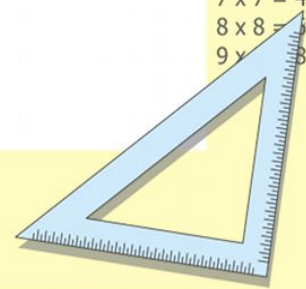
$$\sin 90^\circ = 1$$



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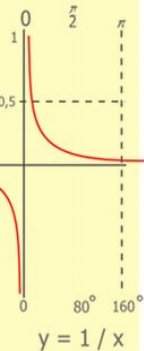
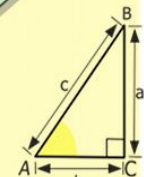
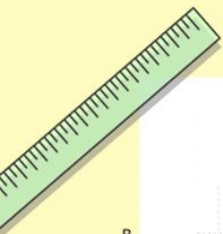


Застосування властивостей

Порівняйте основу $a > 0$ з одиницею, якщо відомо, що вірна нерівність.

$$a^{10} > a^{15}$$

$$0 < a < 1$$



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



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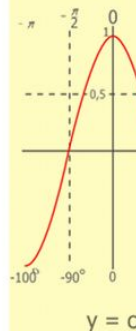
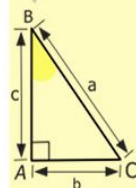
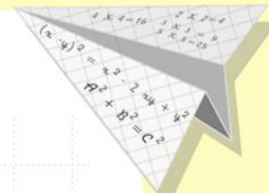
$$\sin 90^\circ = 1$$



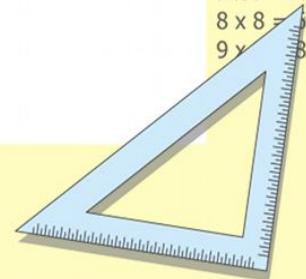
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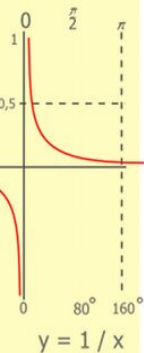
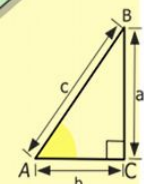
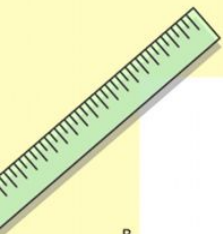
Домашнє завдання:

- §1 ,
№1(1-5)

№1.7

№1.21

№1.28



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



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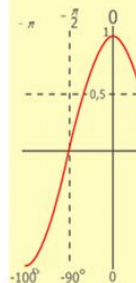
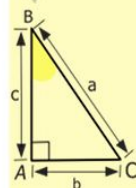
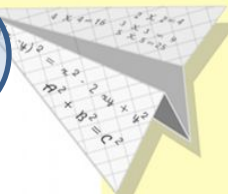
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$$y = \cos$$

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