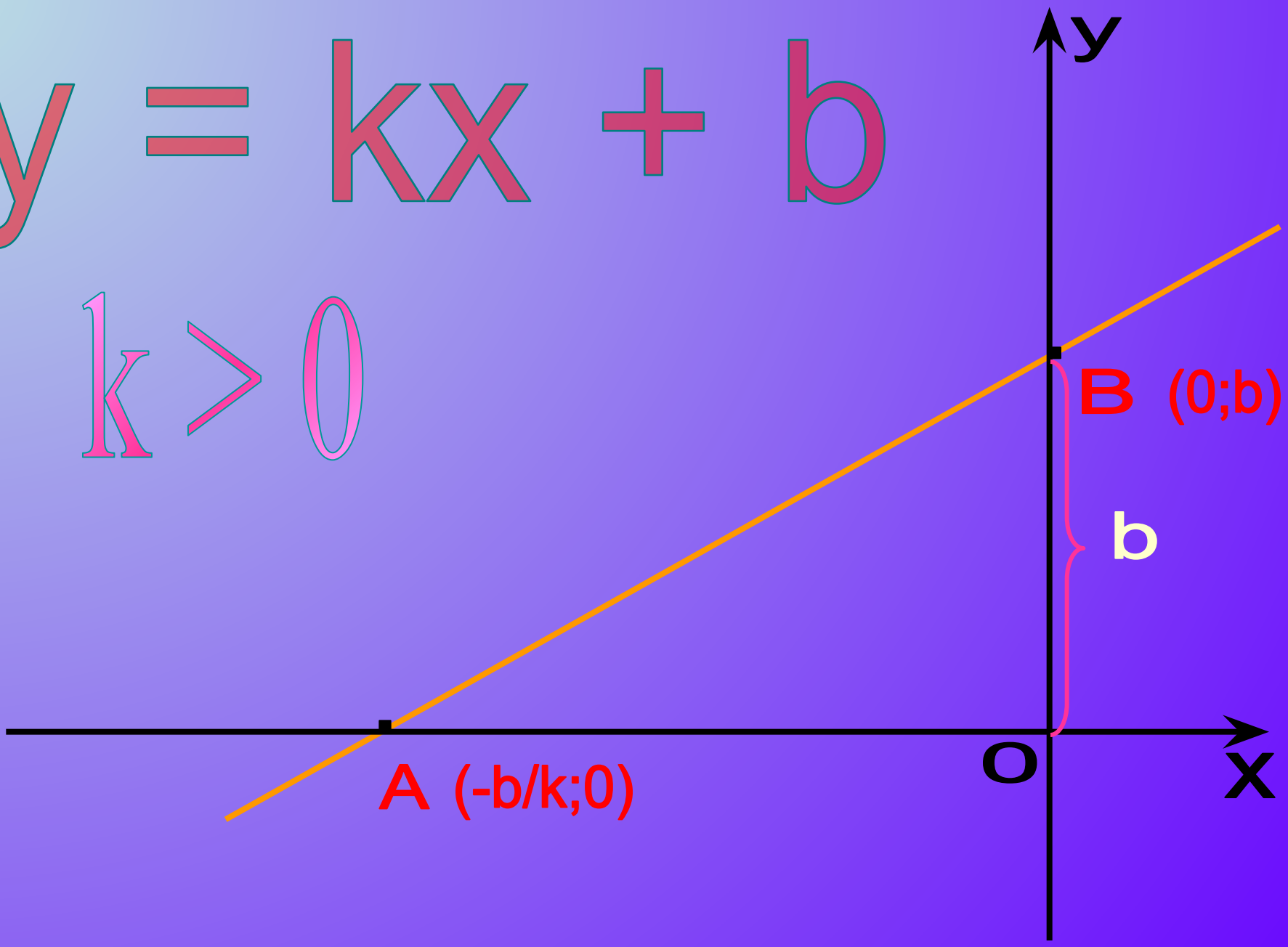
Простейшие элементарные функции

и их графики

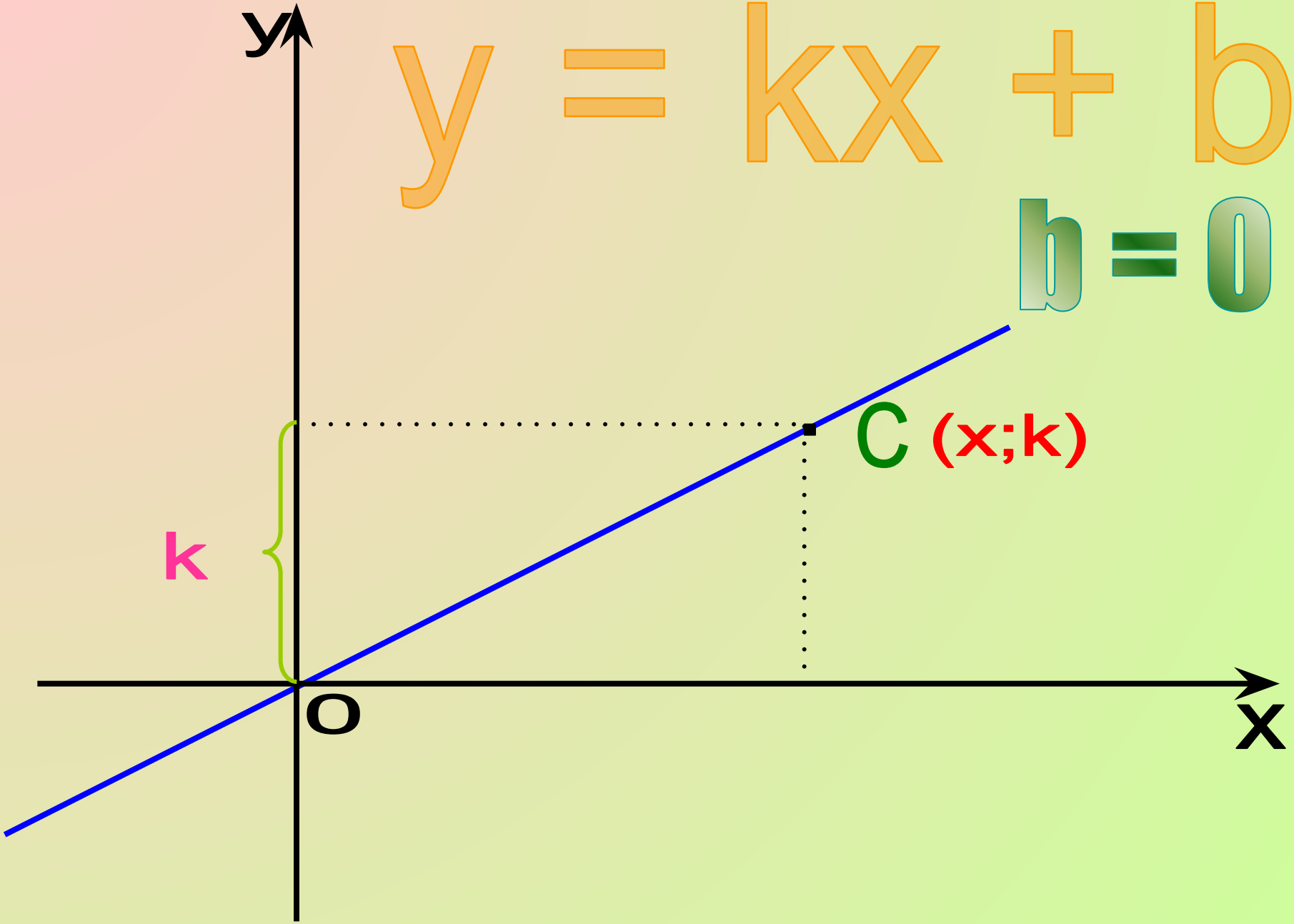
$$y = kx + b$$

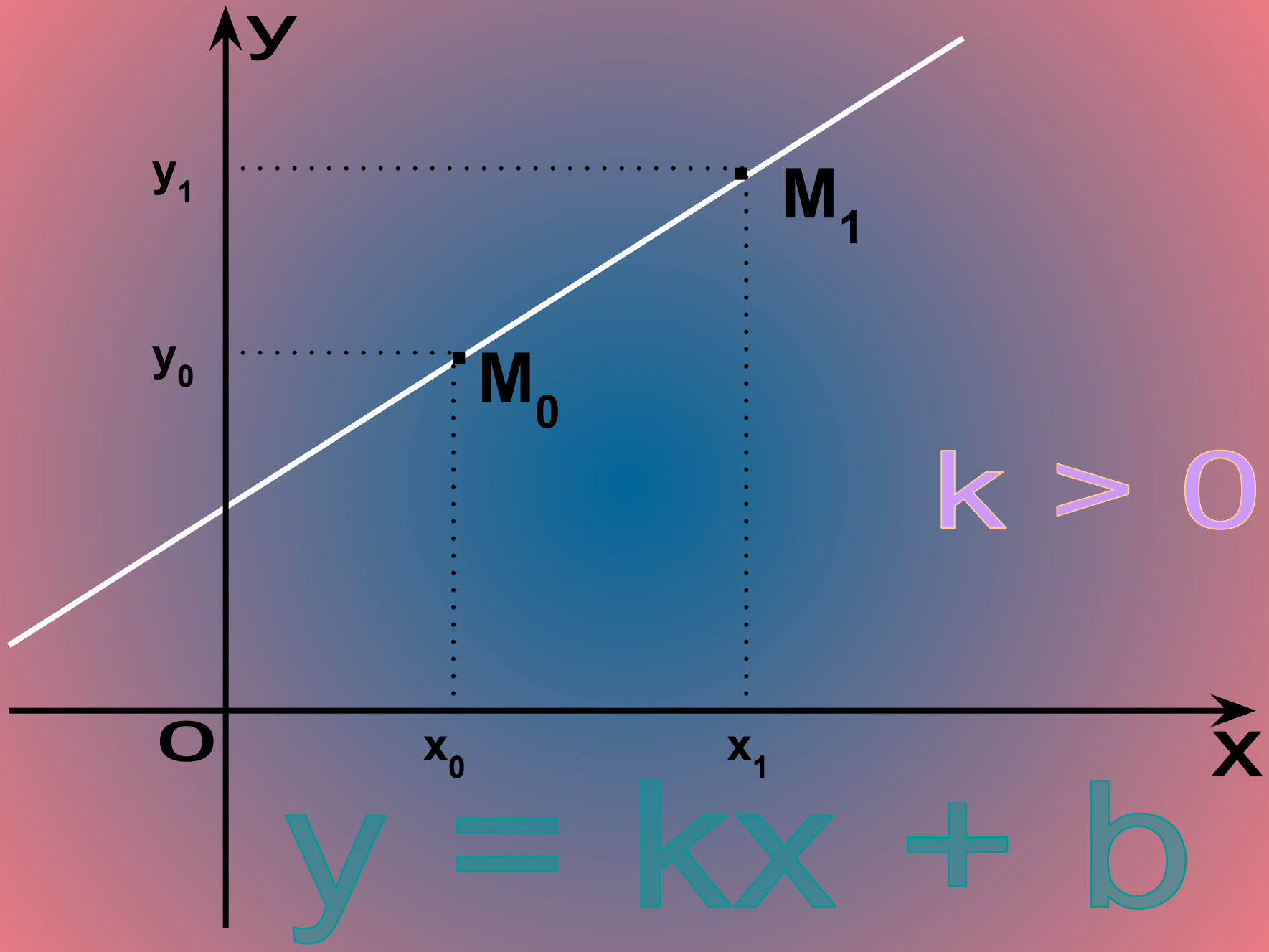
$$k > 0$$



$y = kx + b$

$b = 0$



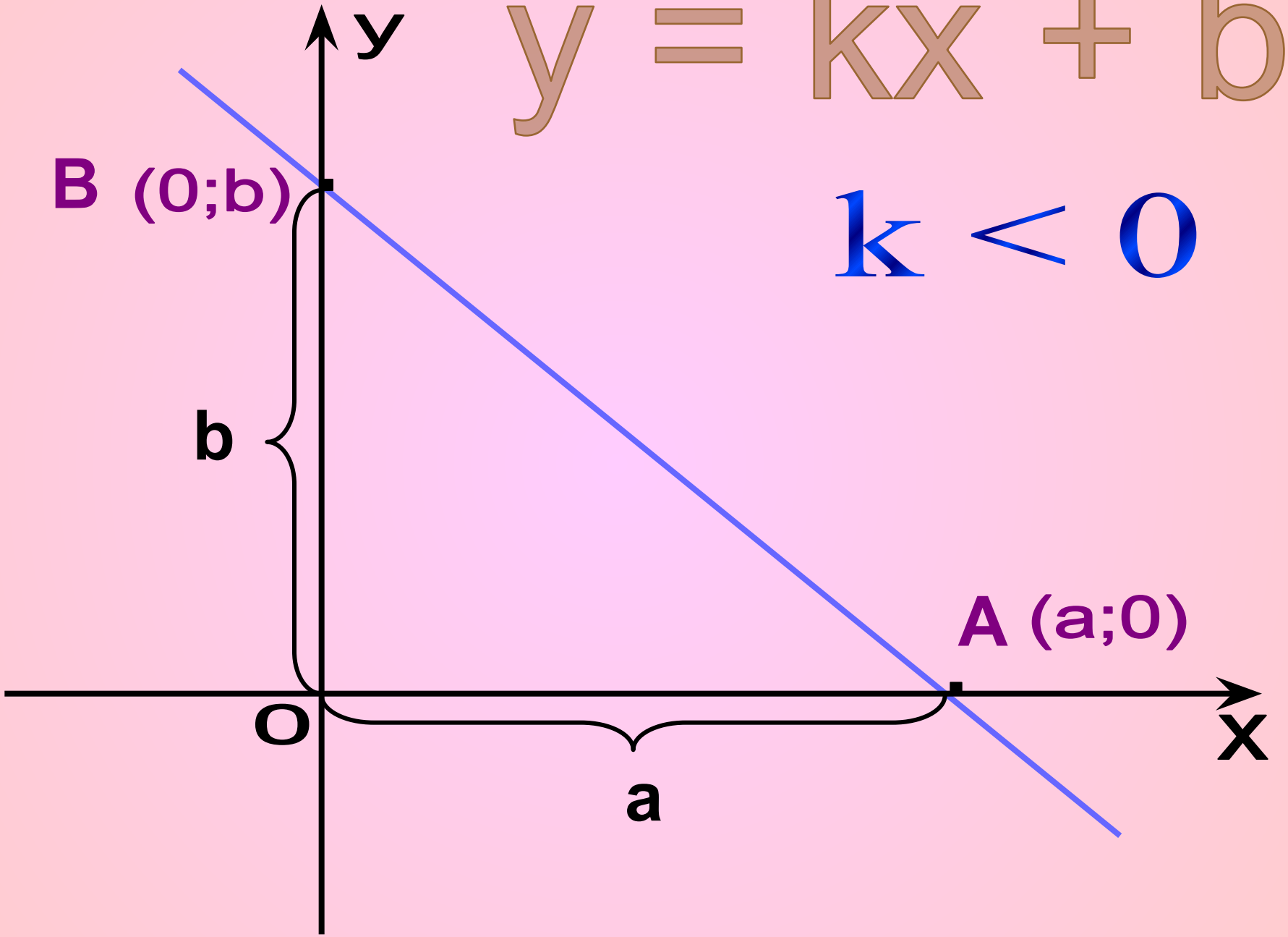


$k > 0$

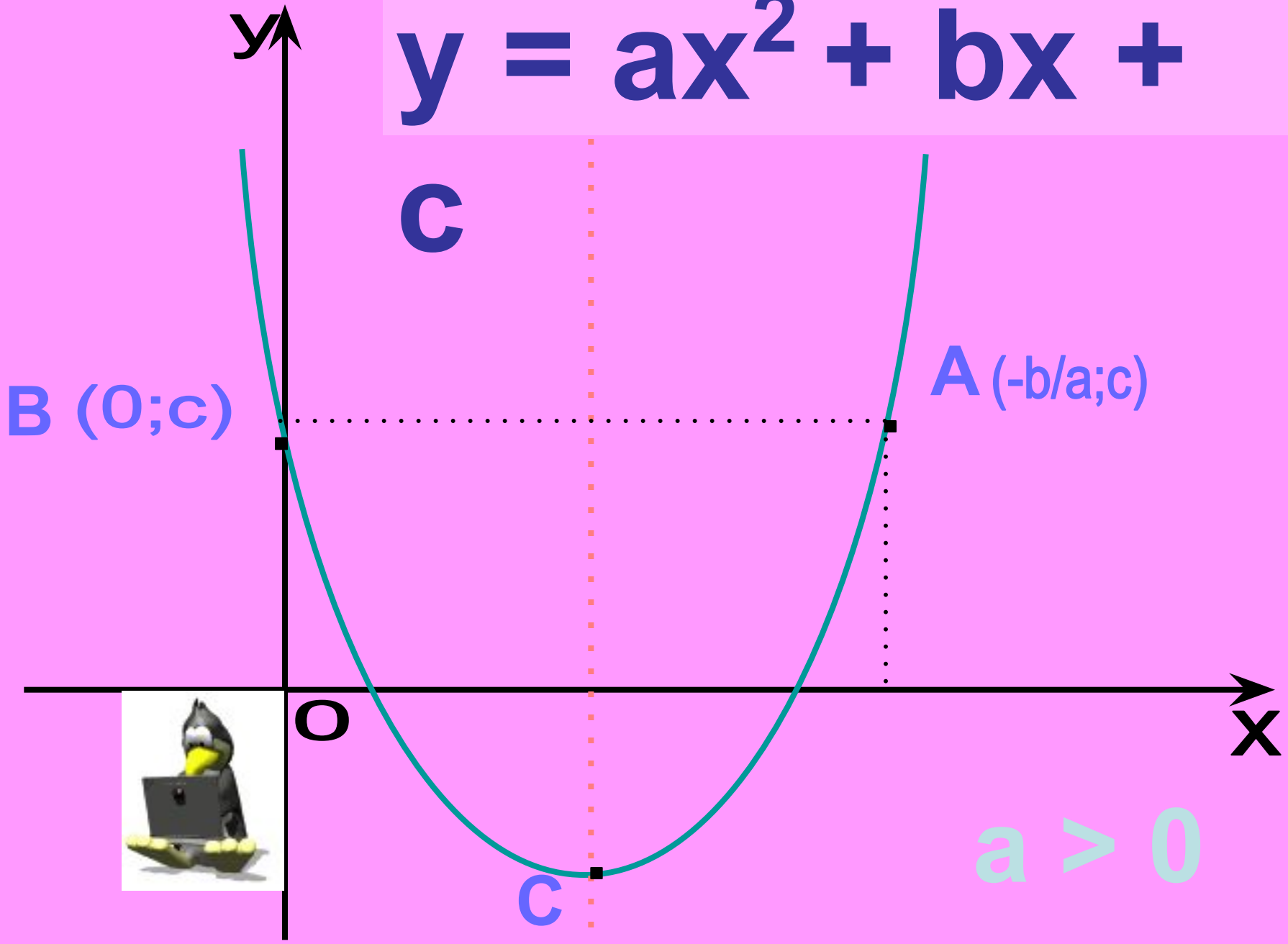
$y = kx + b$

$y = kx + b$

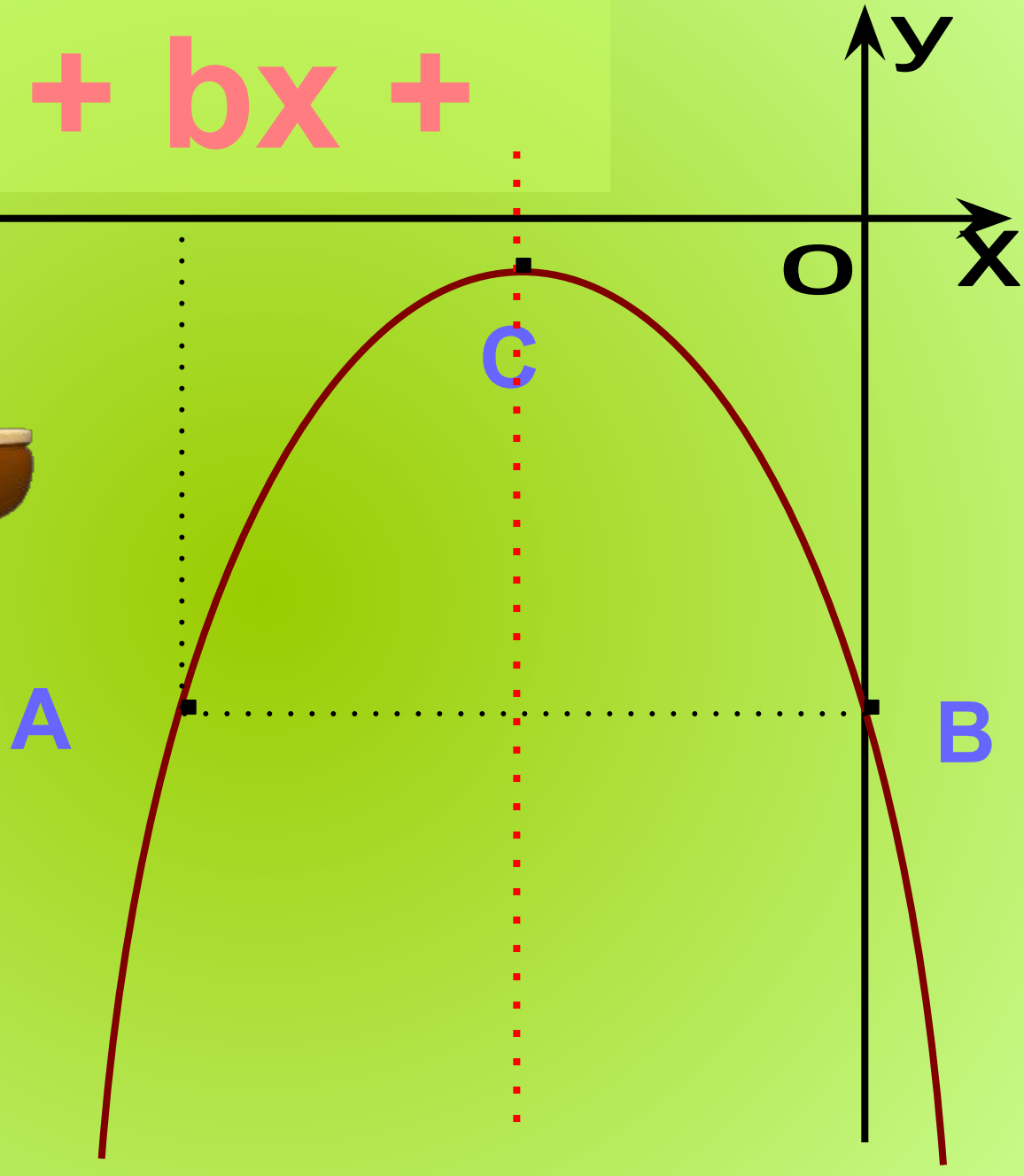
$k < 0$



$y = ax^2 + bx +$ c

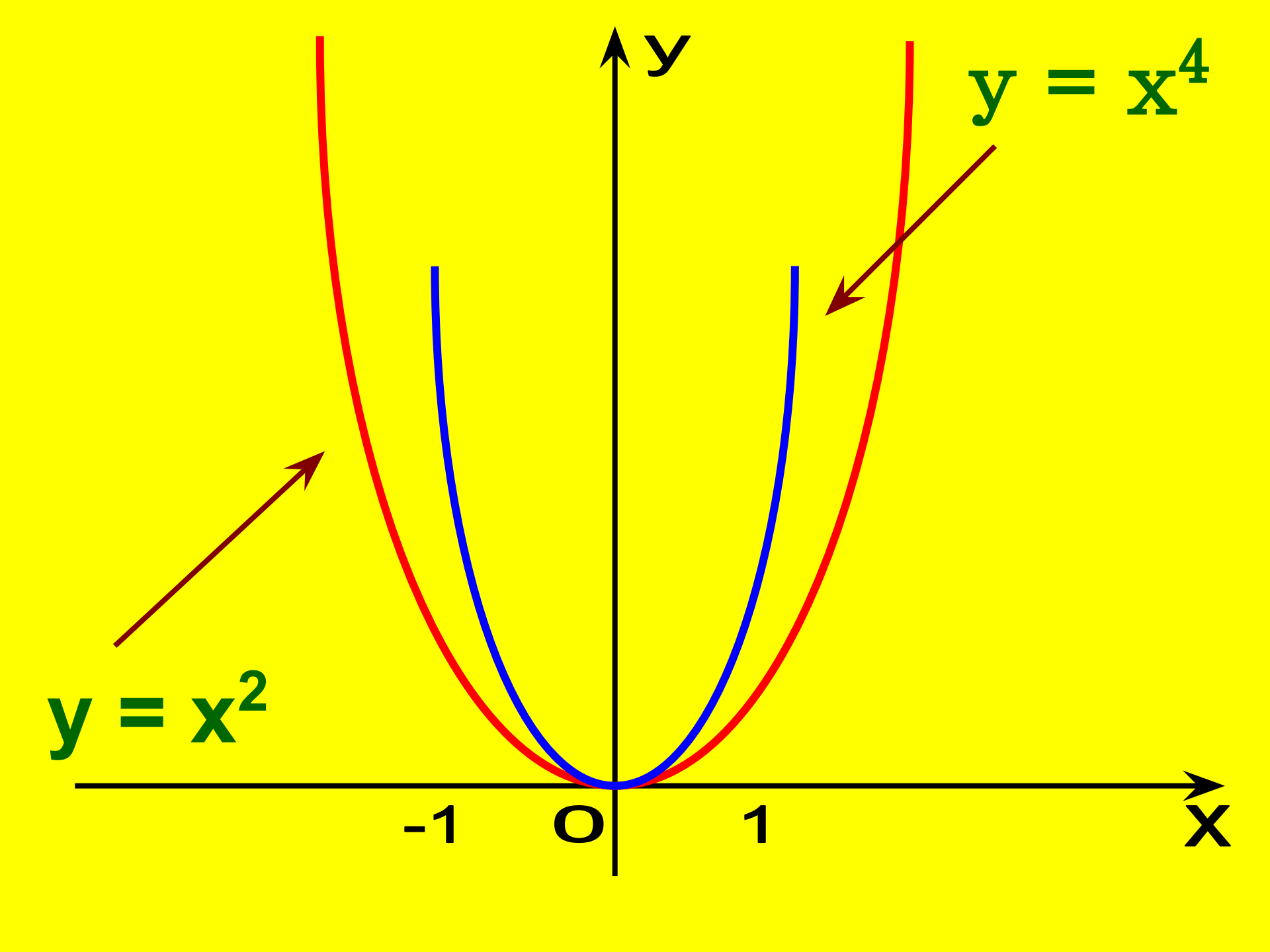


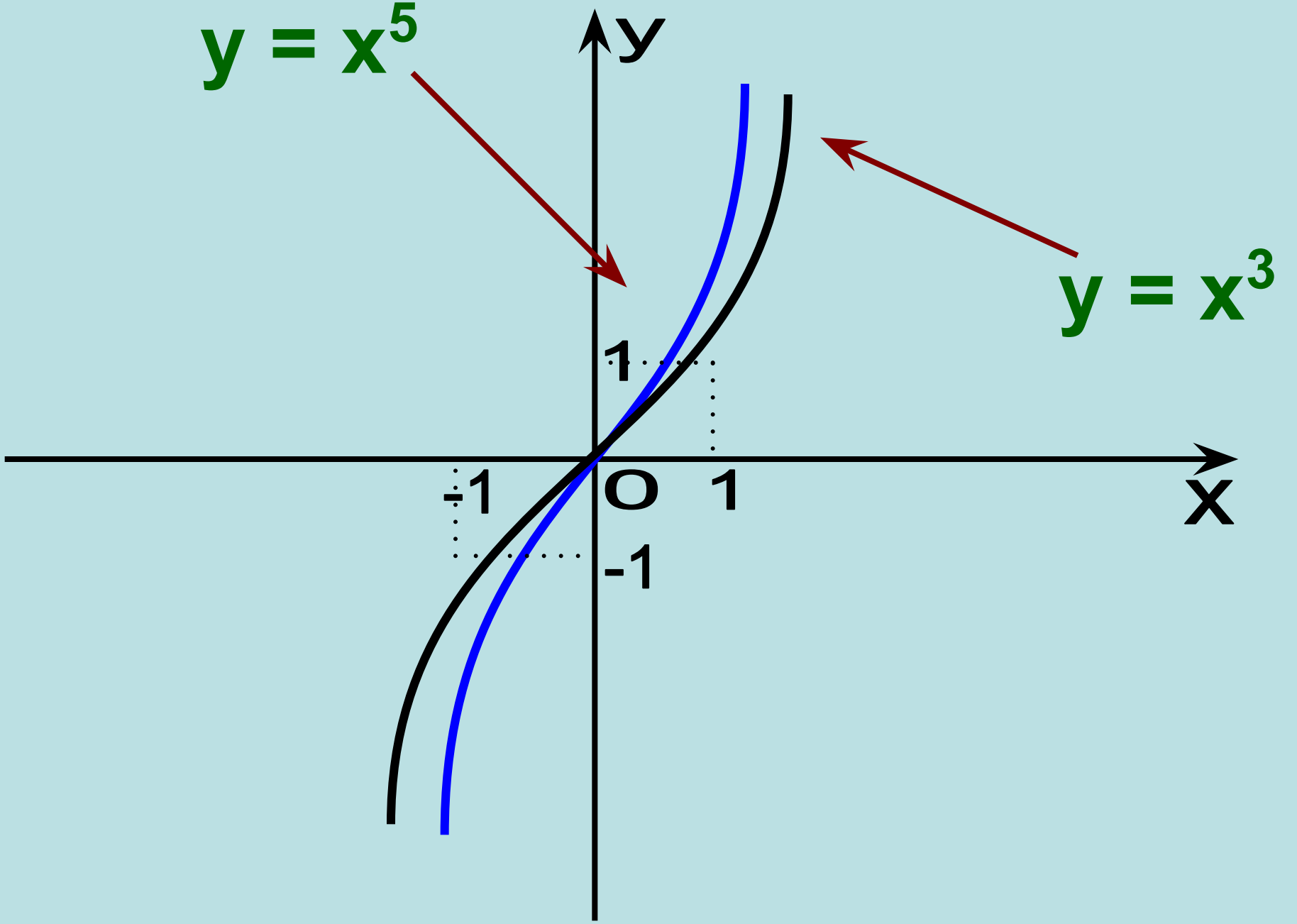
$y = ax^2 + bx +$

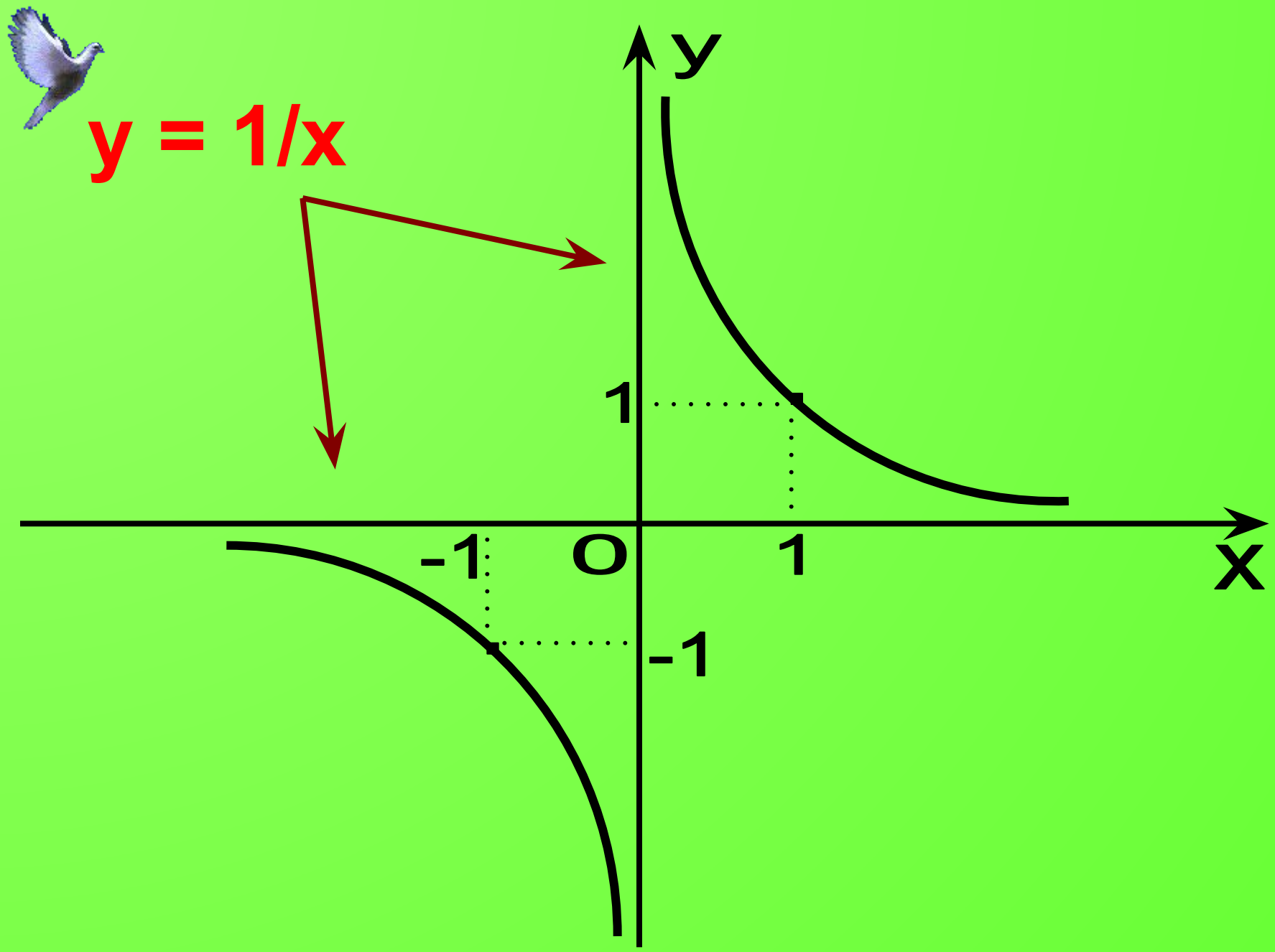


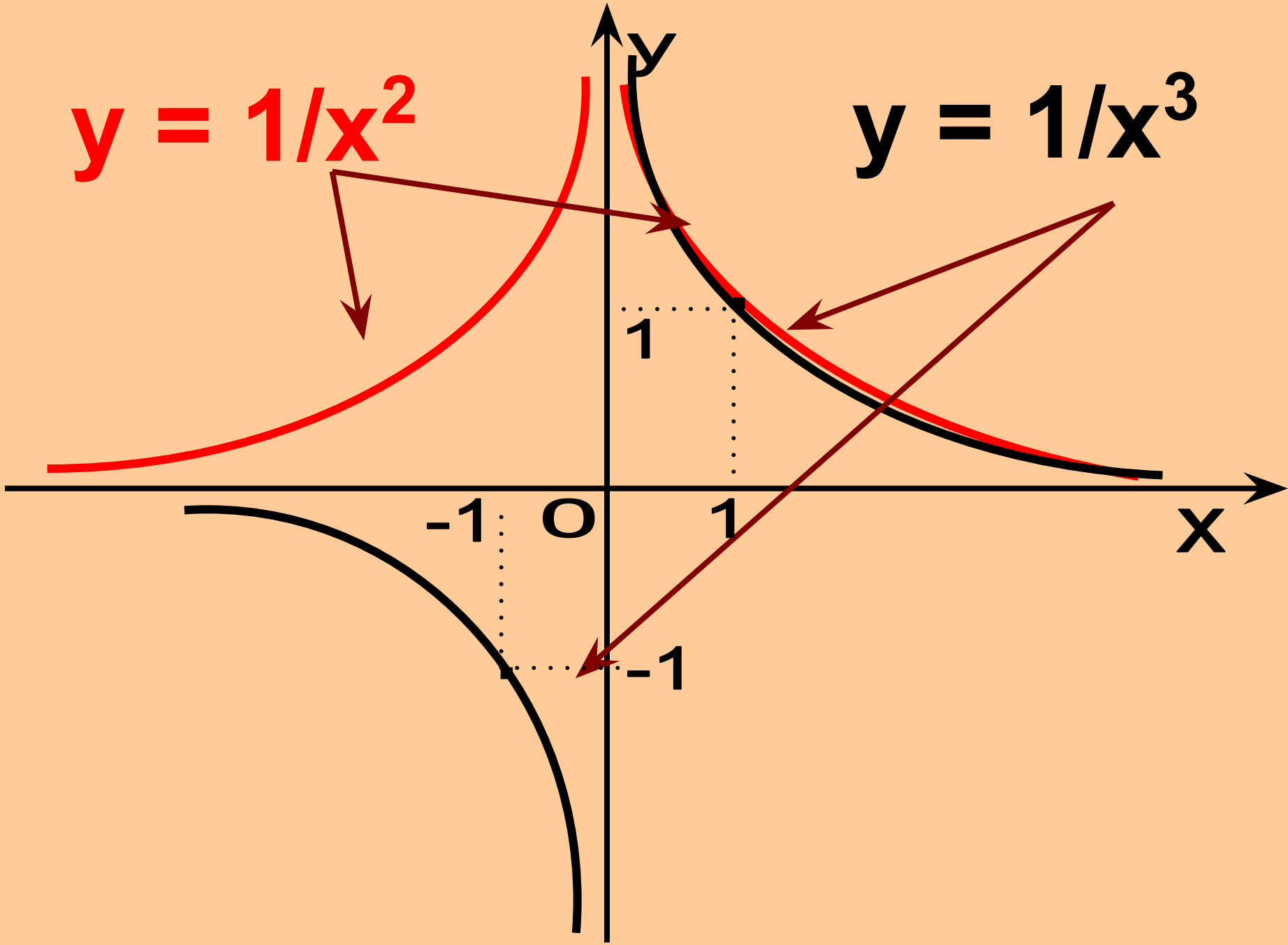
$a < 0$

$D < 0$

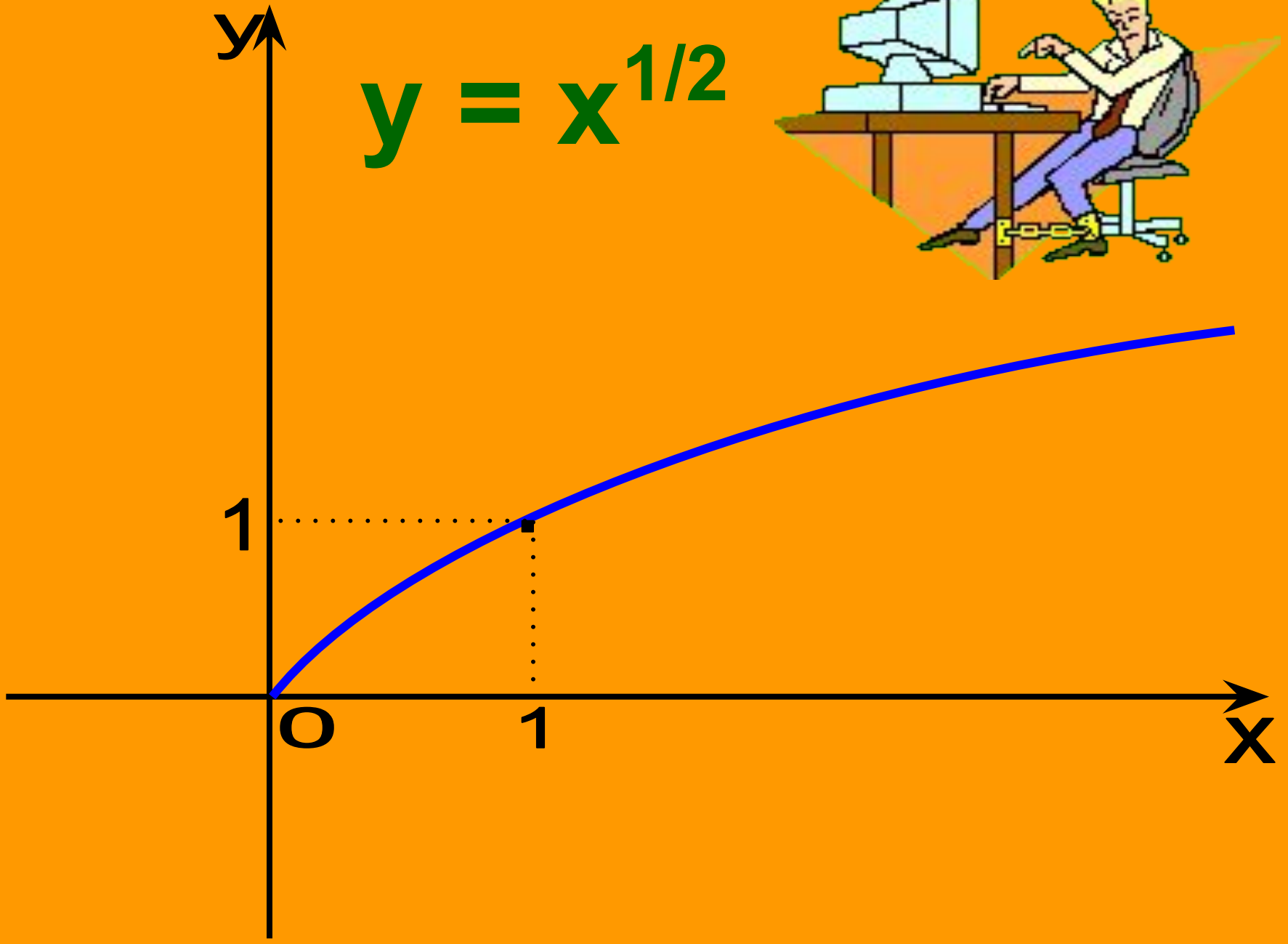

y
x
O
-1
1
$y = x^4$
$y = x^2$

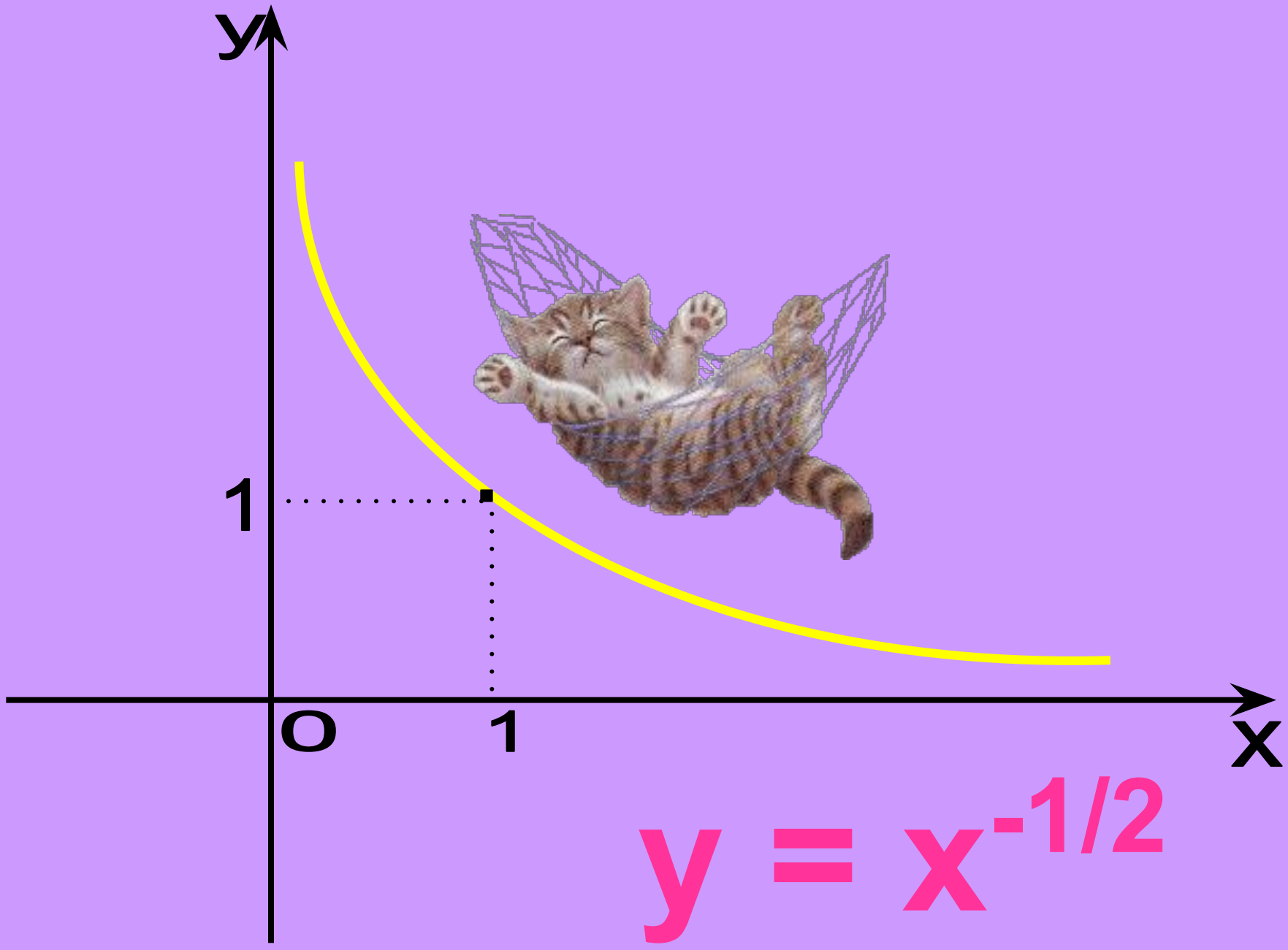

y = x5
y
y = x3
1
-1
O
1
-1
x


y = 1/x
y
1
-1
O
1
X
-1

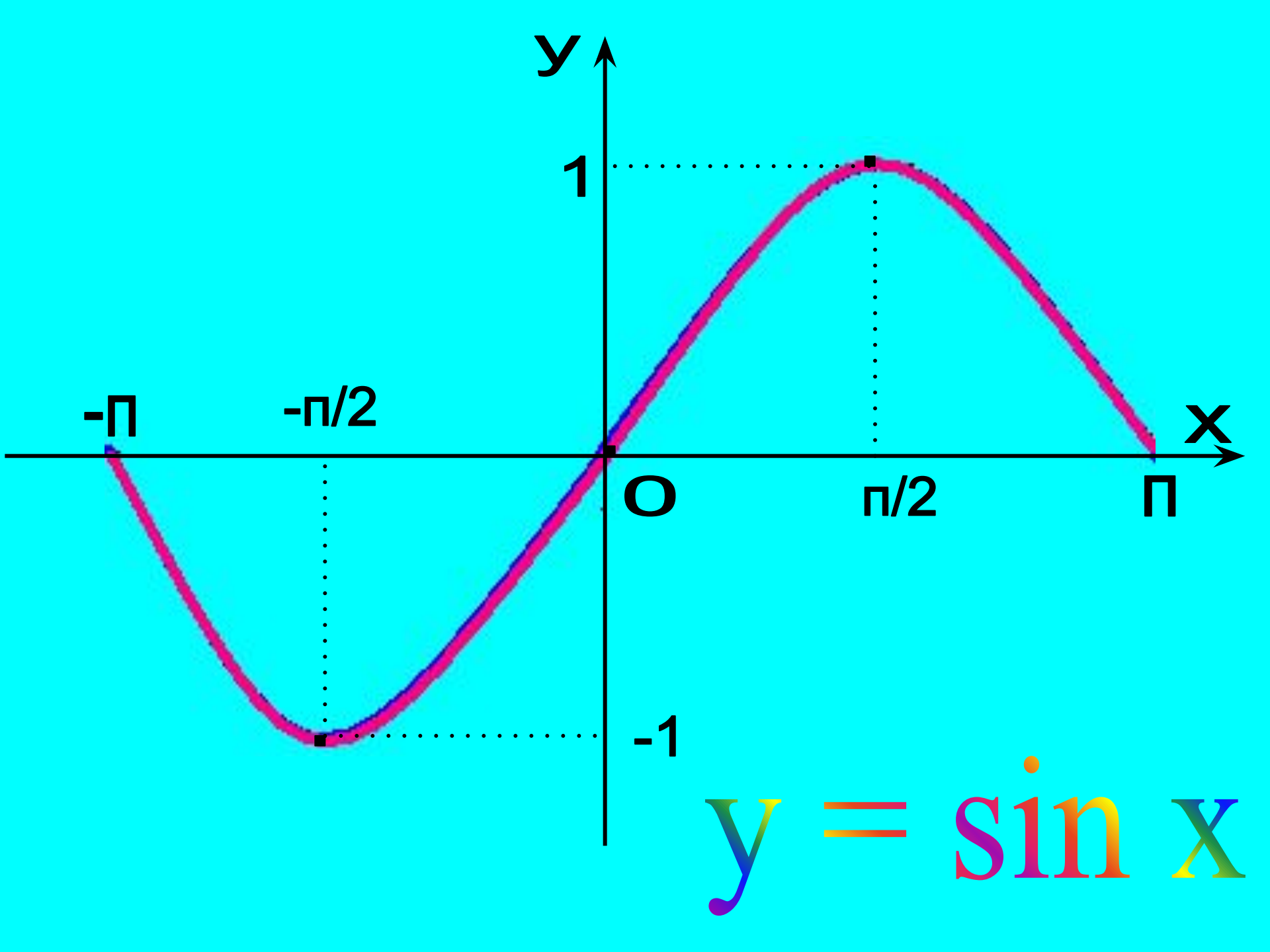

y = 1/x²
y = 1/x³
y
x
O
1
1
-1
-1

$y = x^{1/2}$

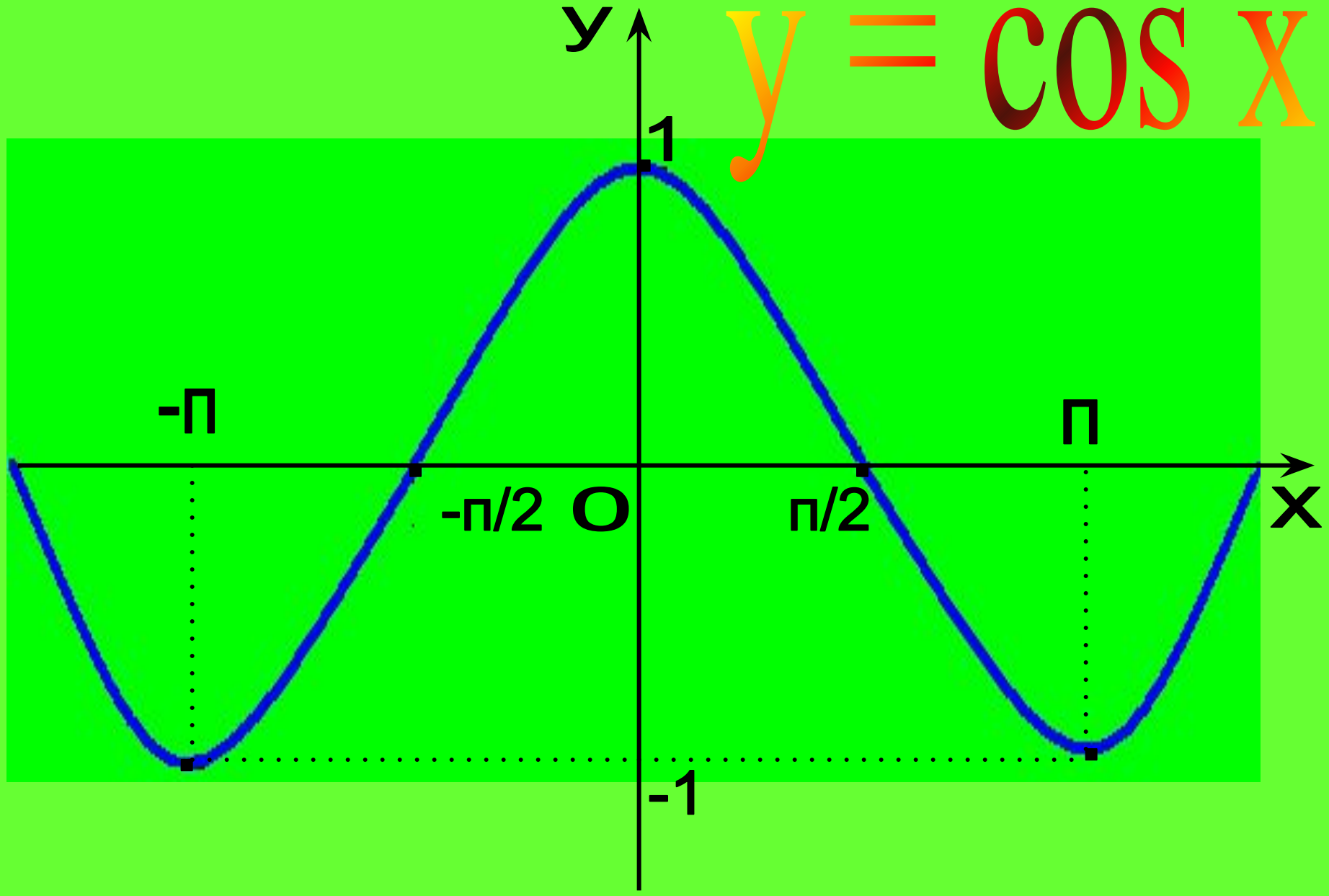


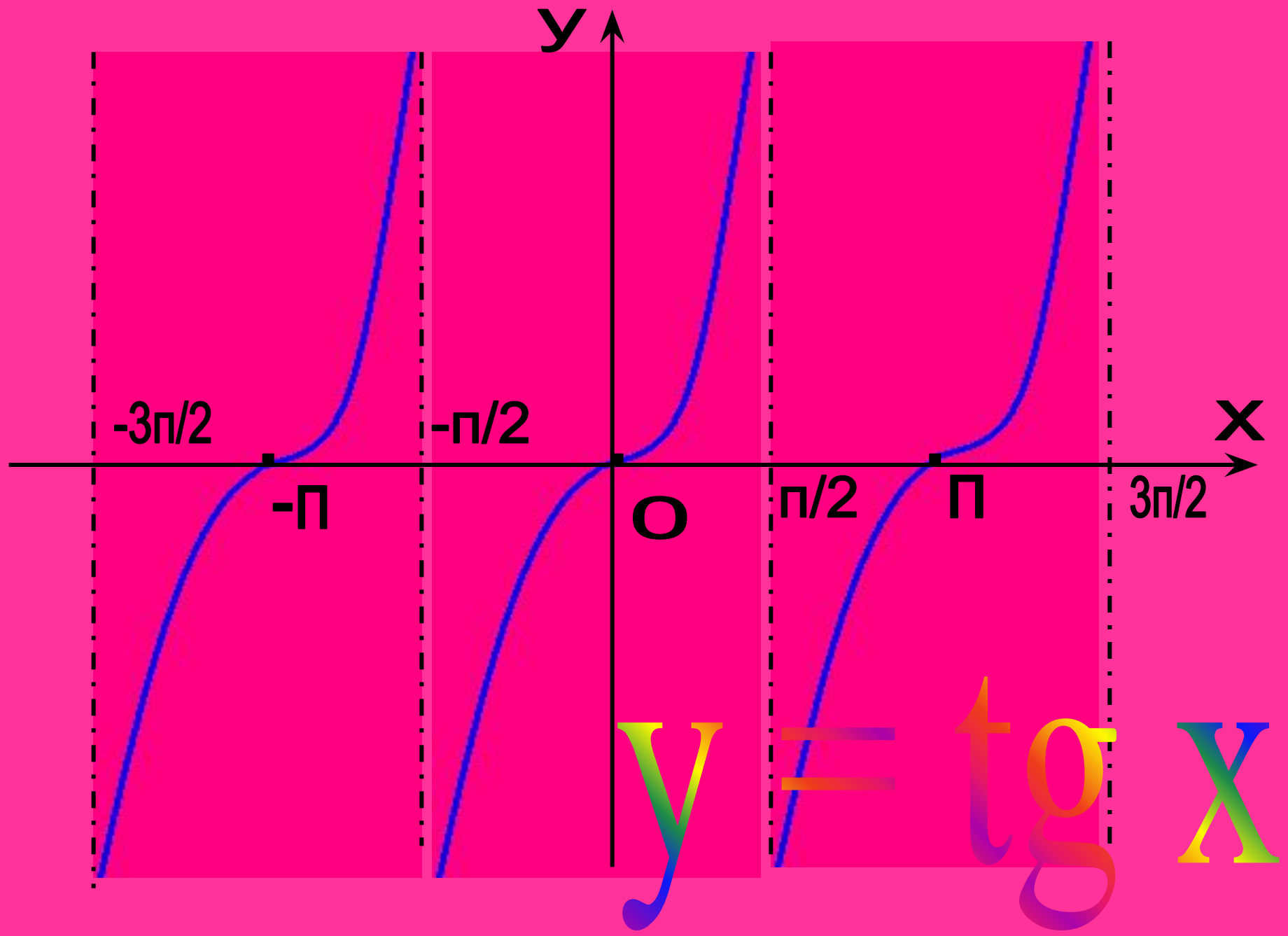


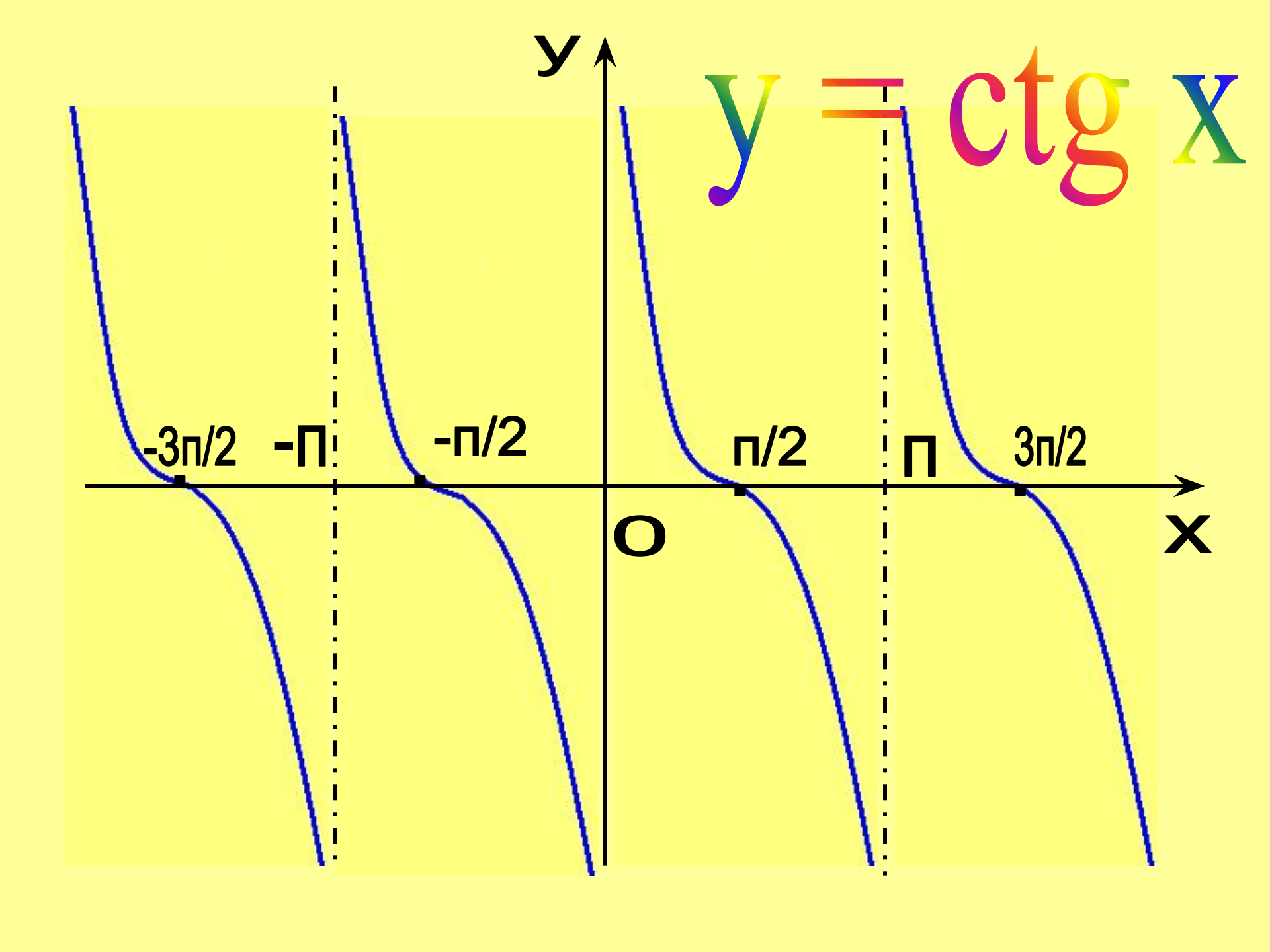
$$y = x^{-1/2}$$

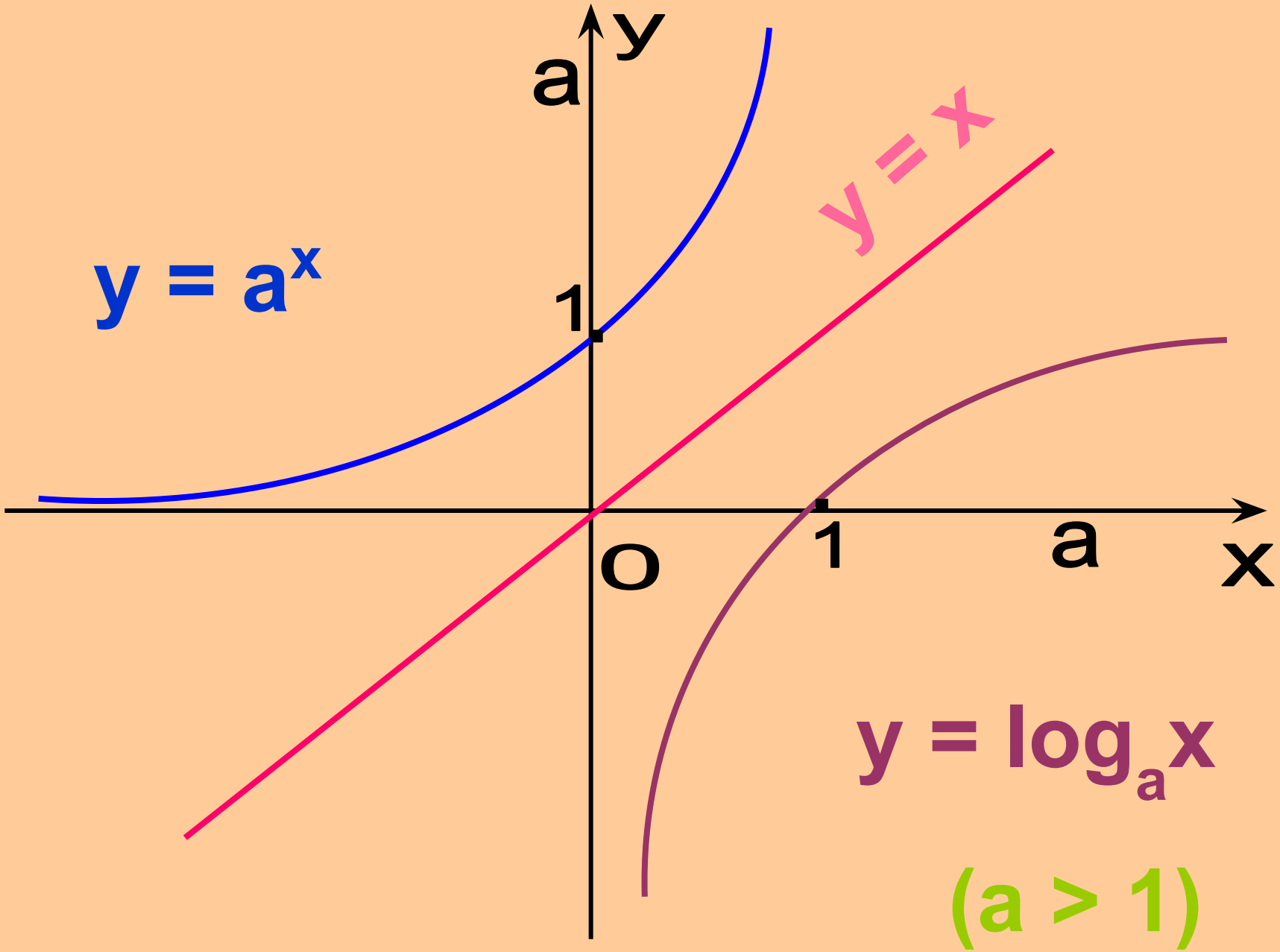

У
1
-П
-п/2
О
п/2
П
Х
-1
y = sin x

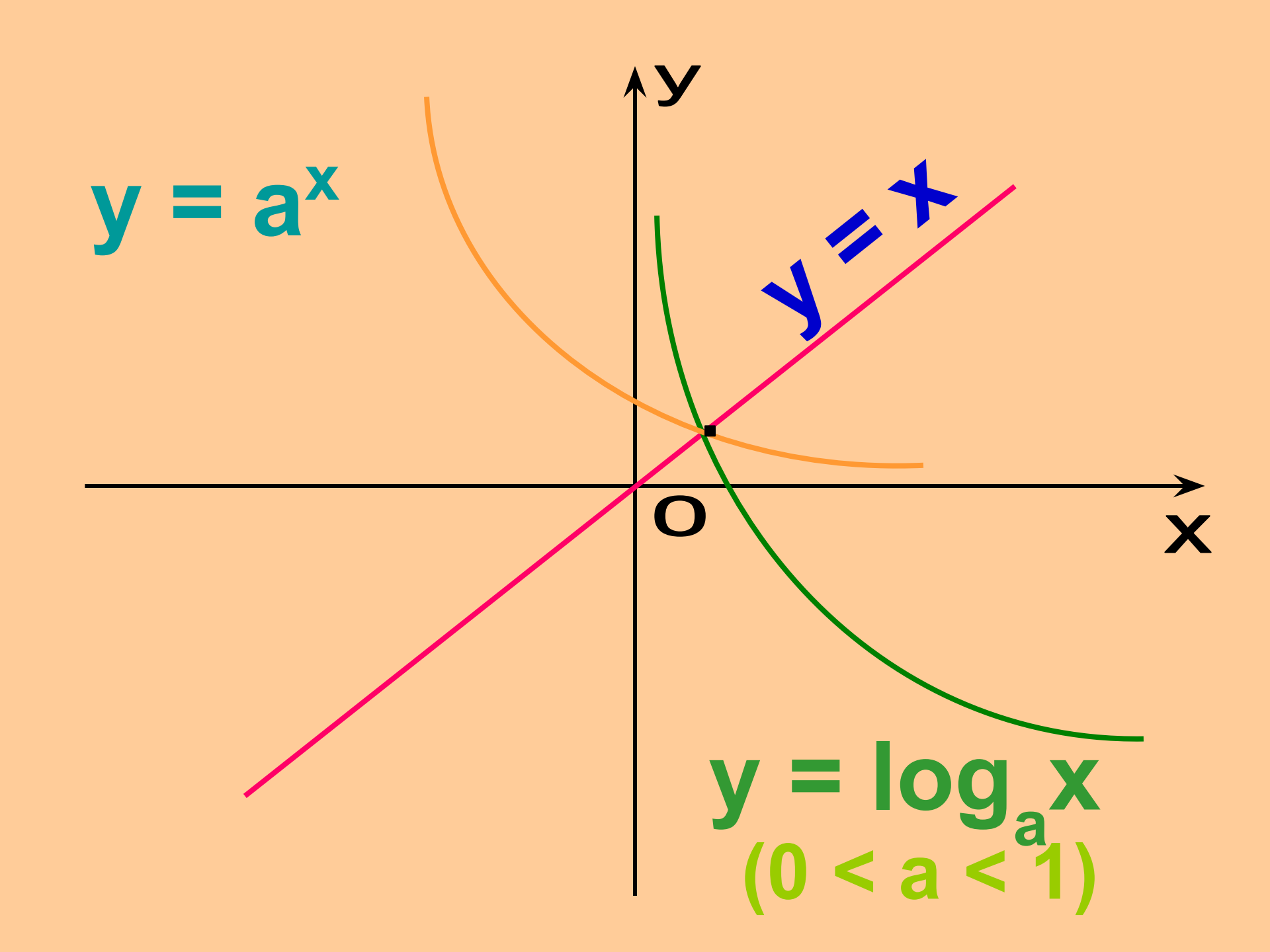
$y = \cos x$




У
Х
-3п/2
-п/2
-П
О
п/2
П
3п/2
y = tg x

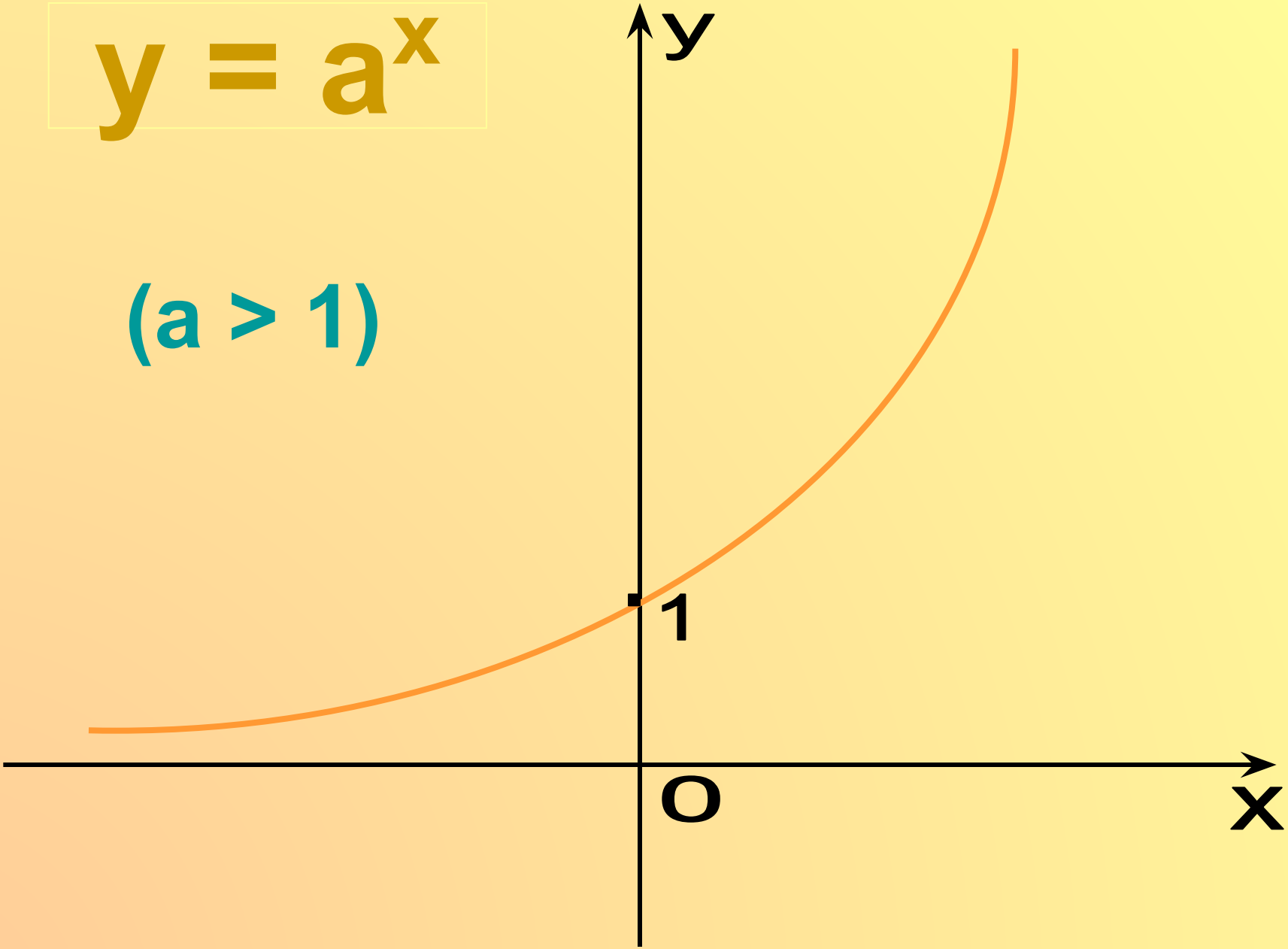

y = ctg x
У
-3п/2
-П
-п/2
О
п/2
П
3п/2
Х


y
a
1
O
1
a
x
$y = a^x$
$y = x$
$y = \log_a x$
(a > 1)


y = a^x
y
y = x
O
x
y = log_a x
(0 < a < 1)

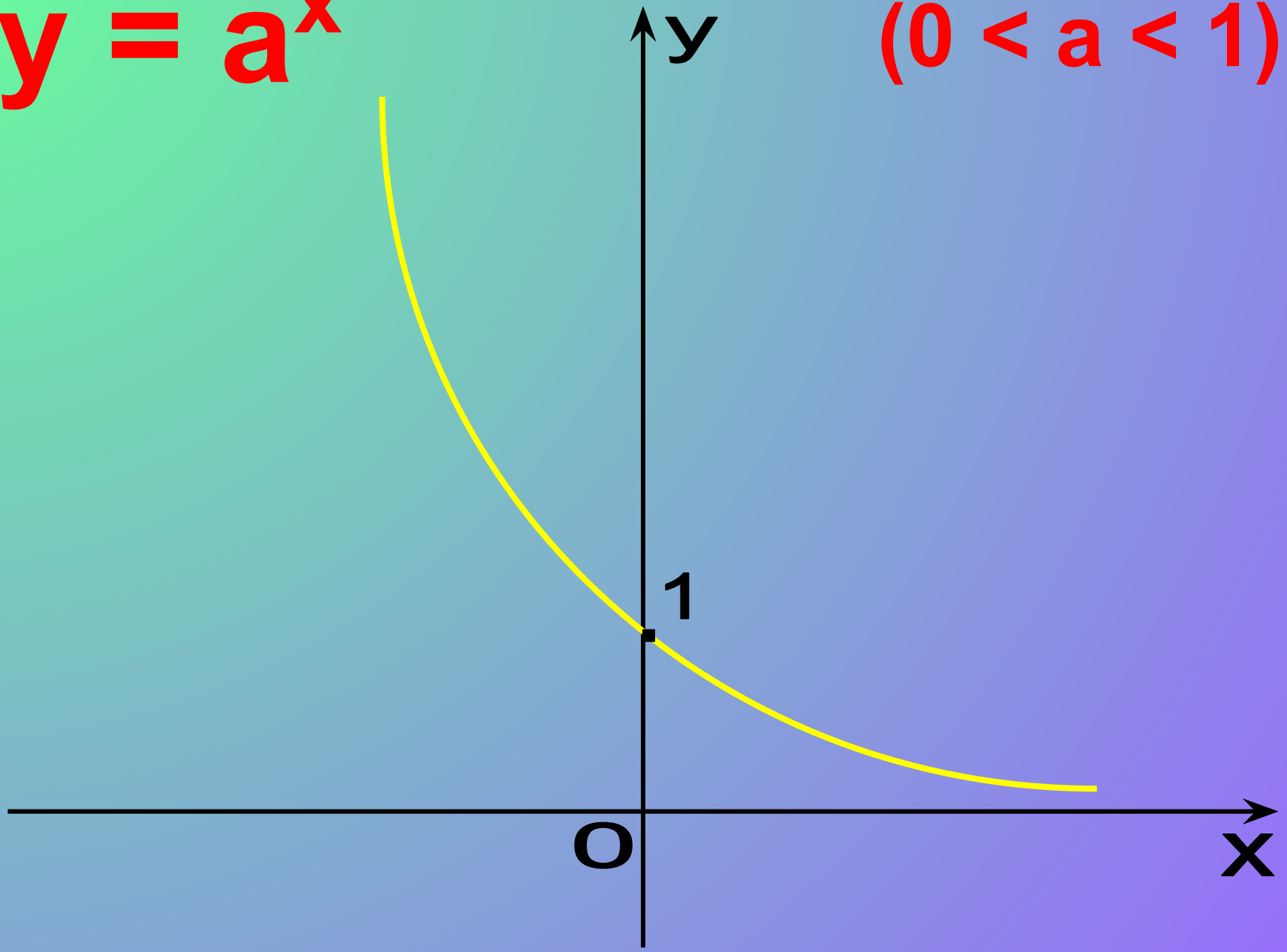
$y = a^x$

$(a > 1)$

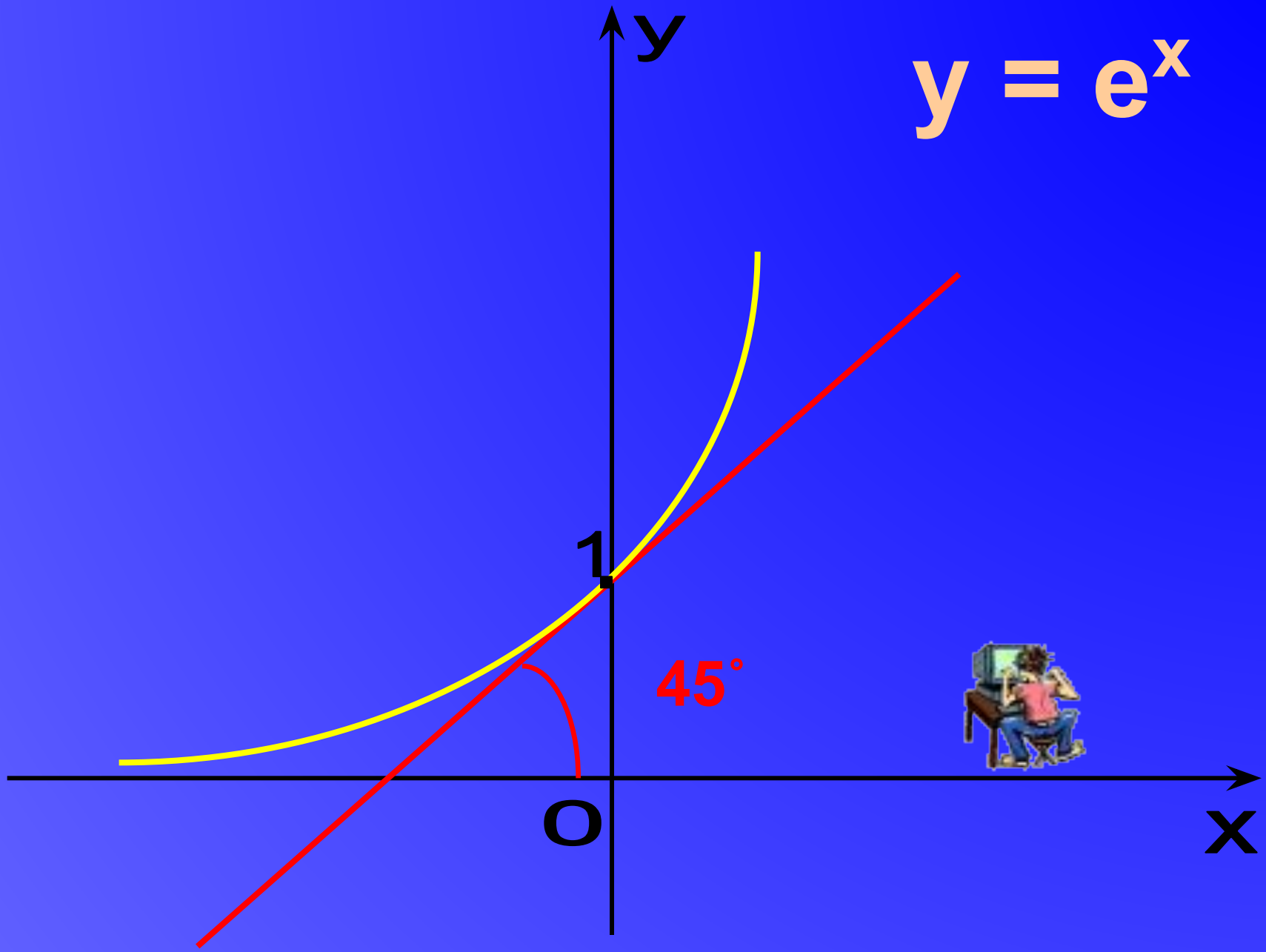


$y = a^x$

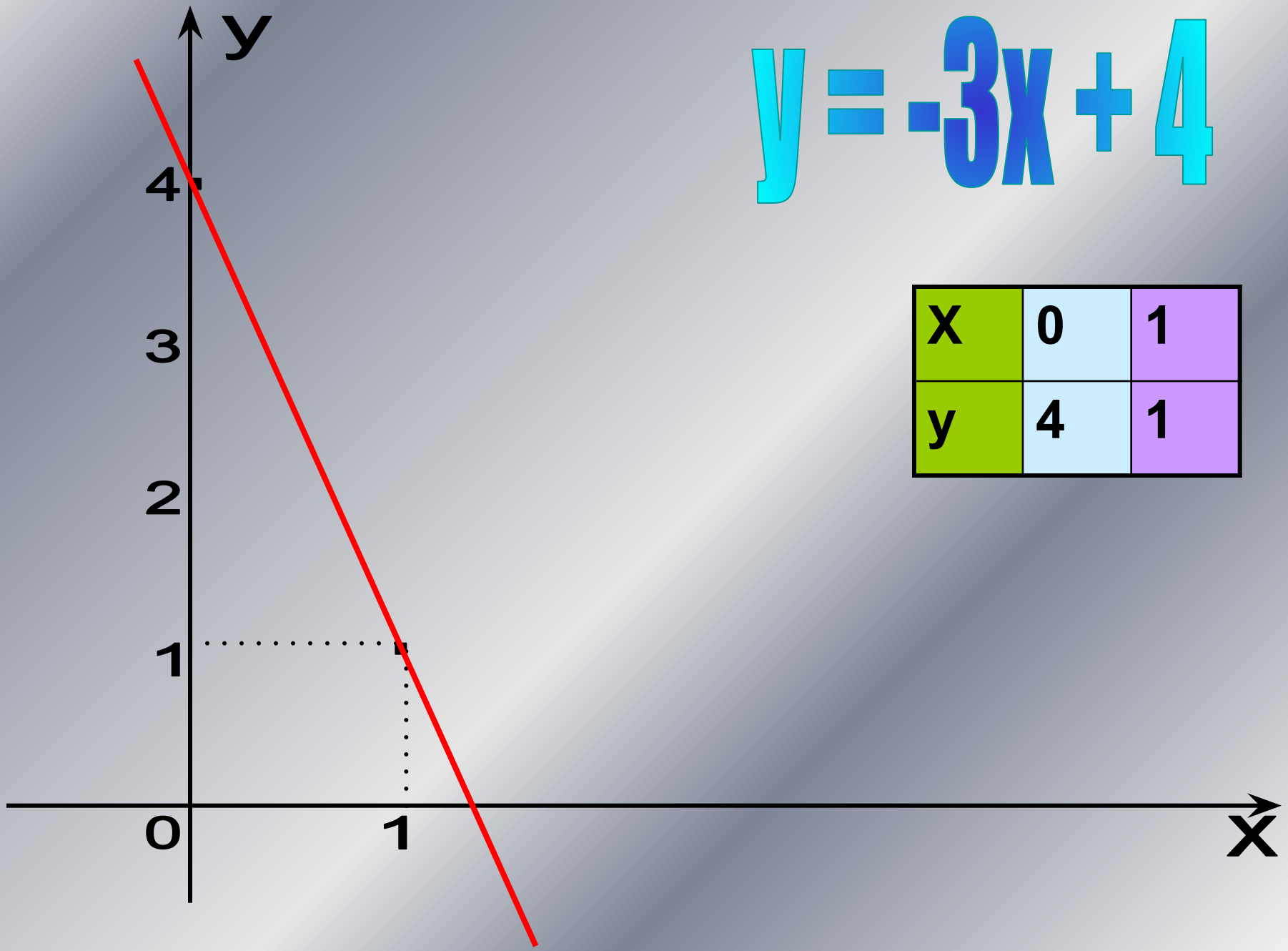
$(0 < a < 1)$



$y = e^x$

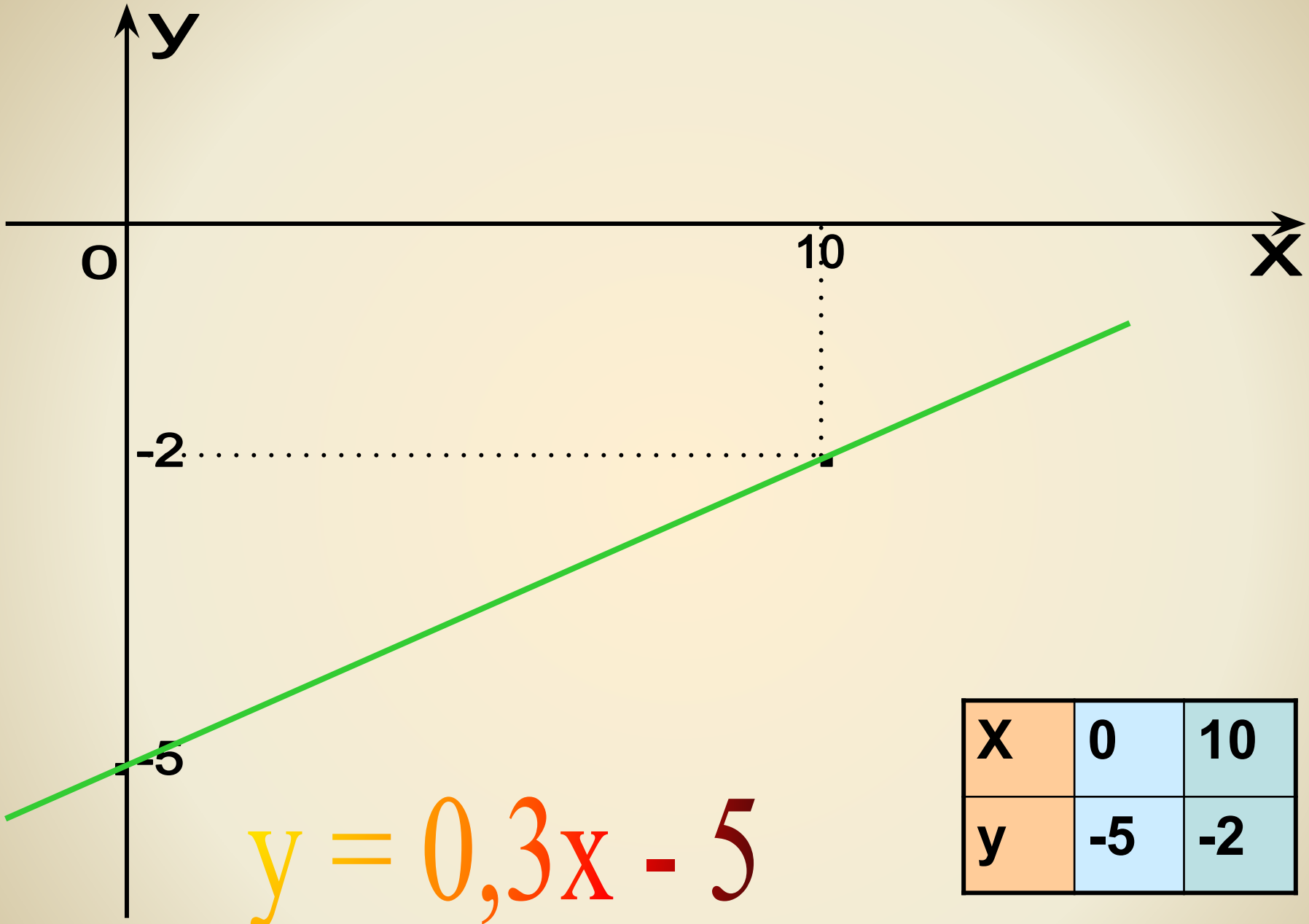


Примеры



$$y = -3x + 4$$

x	0	1
y	4	1



$$y = 0{,}3x - 5$$

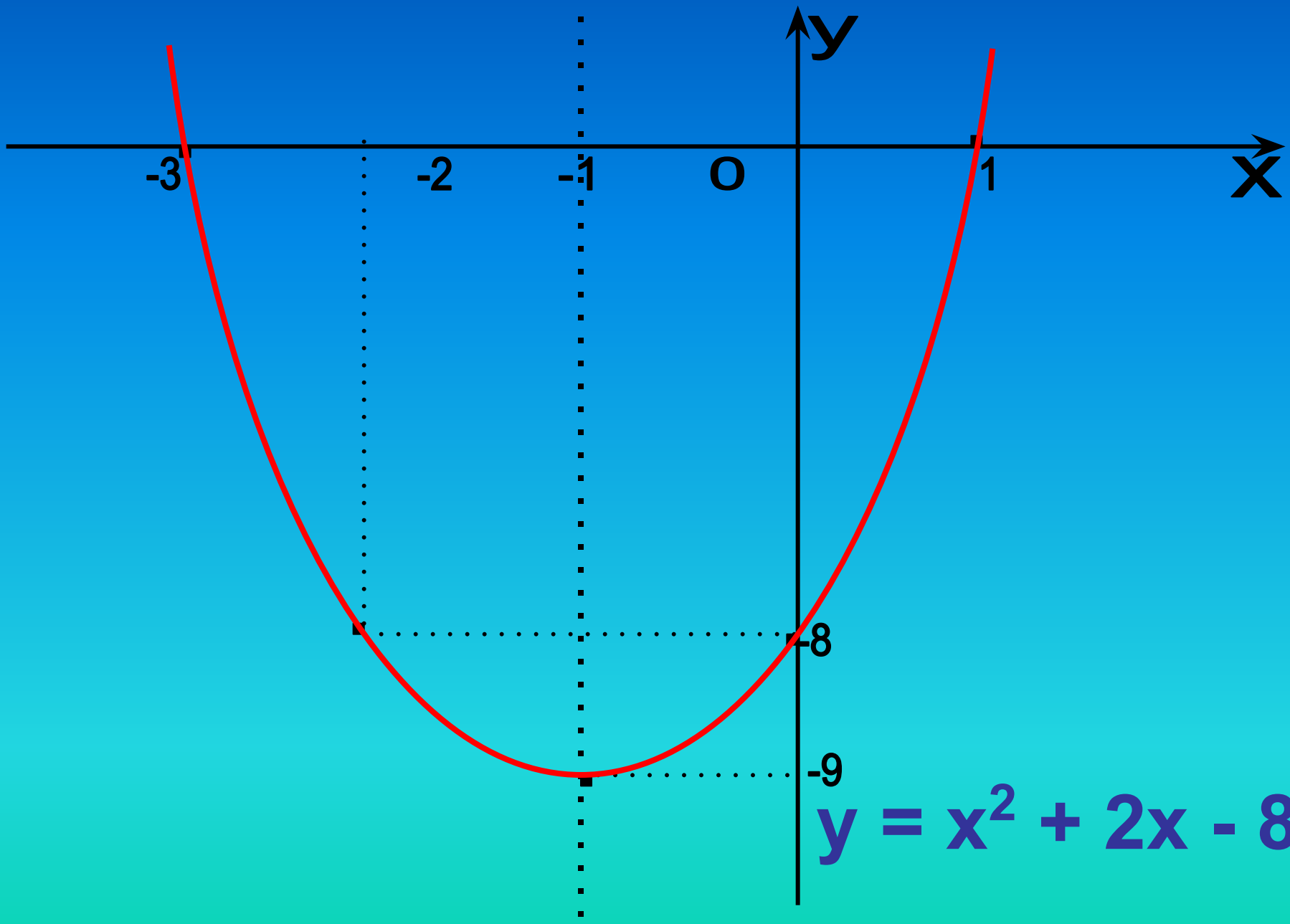
x	0	10
y	-5	-2

Построить график функции $y = x^2 + 2x – 8$.

1. Графиком функции является парабола, ветви которой направлены вверх.
2. $x_в = -b/2a = -1$; $y_в = -9$.
3. Нули функции: $y = 0$

   $x^2 + 2x – 8 = 0$, $D = 36$, $x_1 = -4$, $x_2 = 2$
4. Пересечение с осью OY: $x = 0$, $y = -8$

   $x = -2$, $y = -8$
5. Строим график.



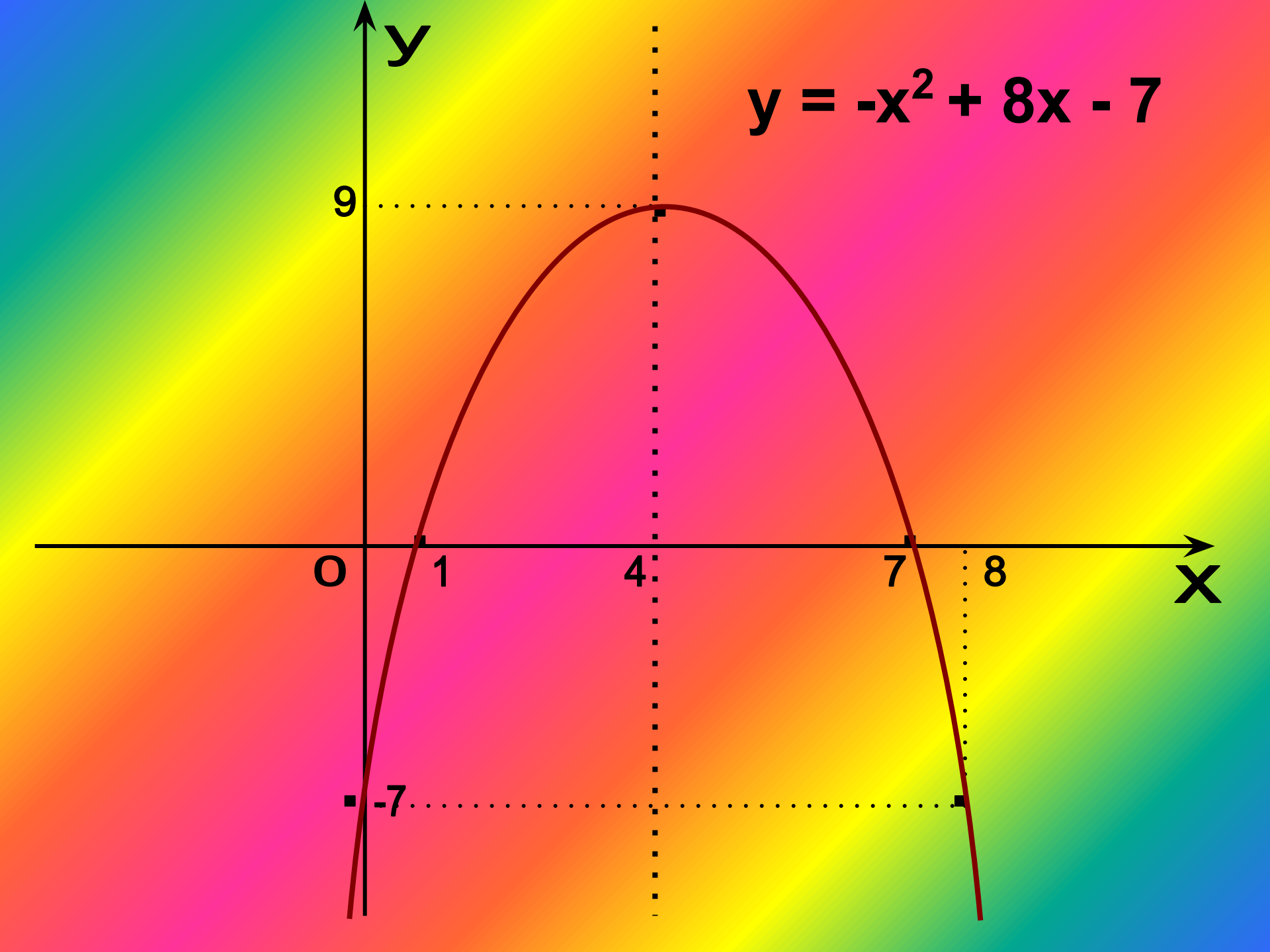
$y = x^2 + 2x - 8$

Построить график функции $y = -x^2 + 8x - 7$.

1. Графиком функции является парабола, ветви которой направлены вниз.
2. $x_в = -b/2a = 4$; $y_в = 9$
3. Нули функции: $y = 0$

   $-x^2 + 8x - 7 = 0$, $D = 36$, $x_1 = 7$, $x_2 = 1$
4. Пересечение с осью OY: $x = 0$, $y = -7$

   $x = 8$, $y = -7$
5. Строим график.


y
x
O
1
4
7
8
9
-7
y = -x² + 8x - 7

На этом пока и закончим

первоначальное знакомство
с простейшими
ФУНКЦИЯМИ и их графиками.