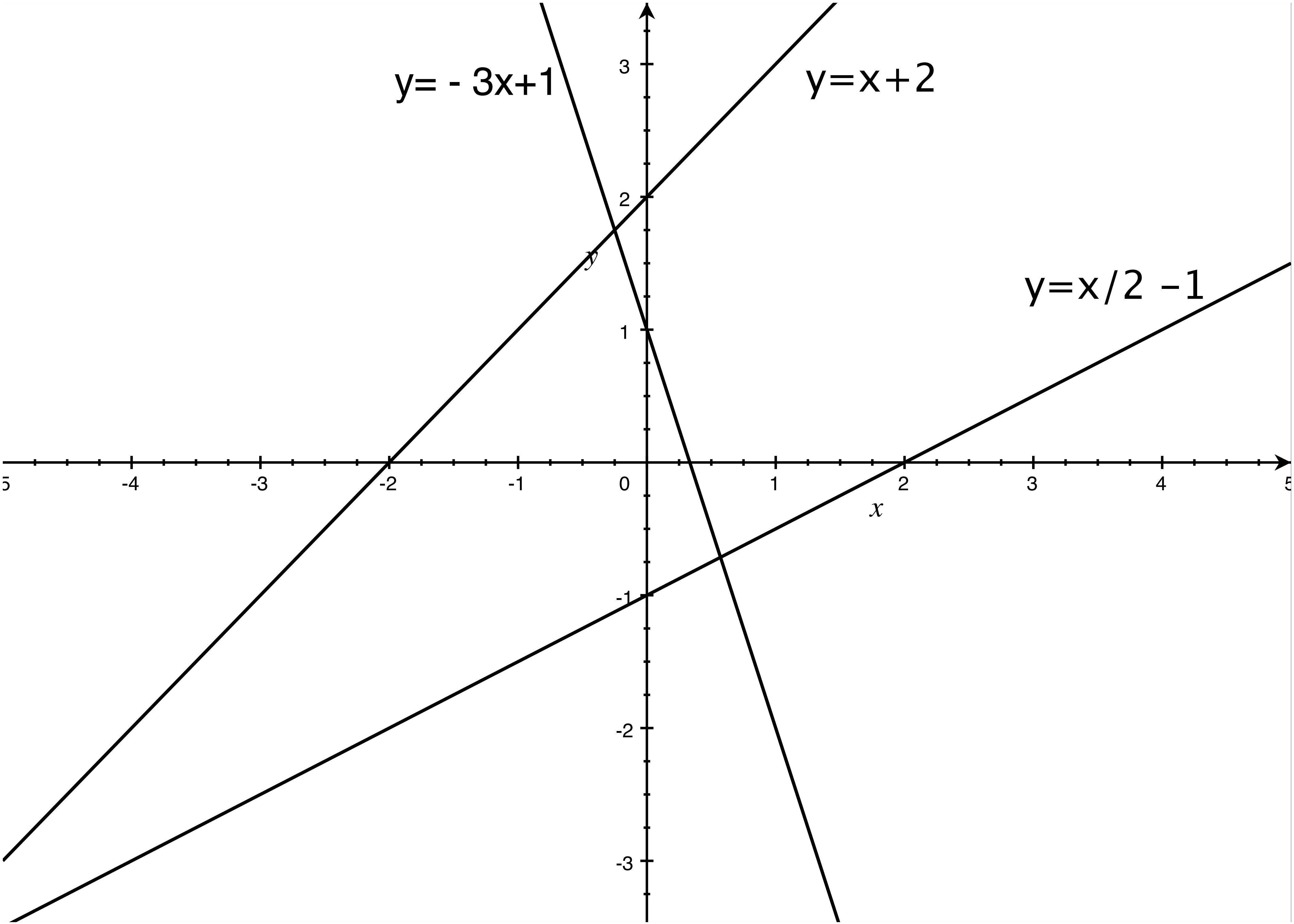
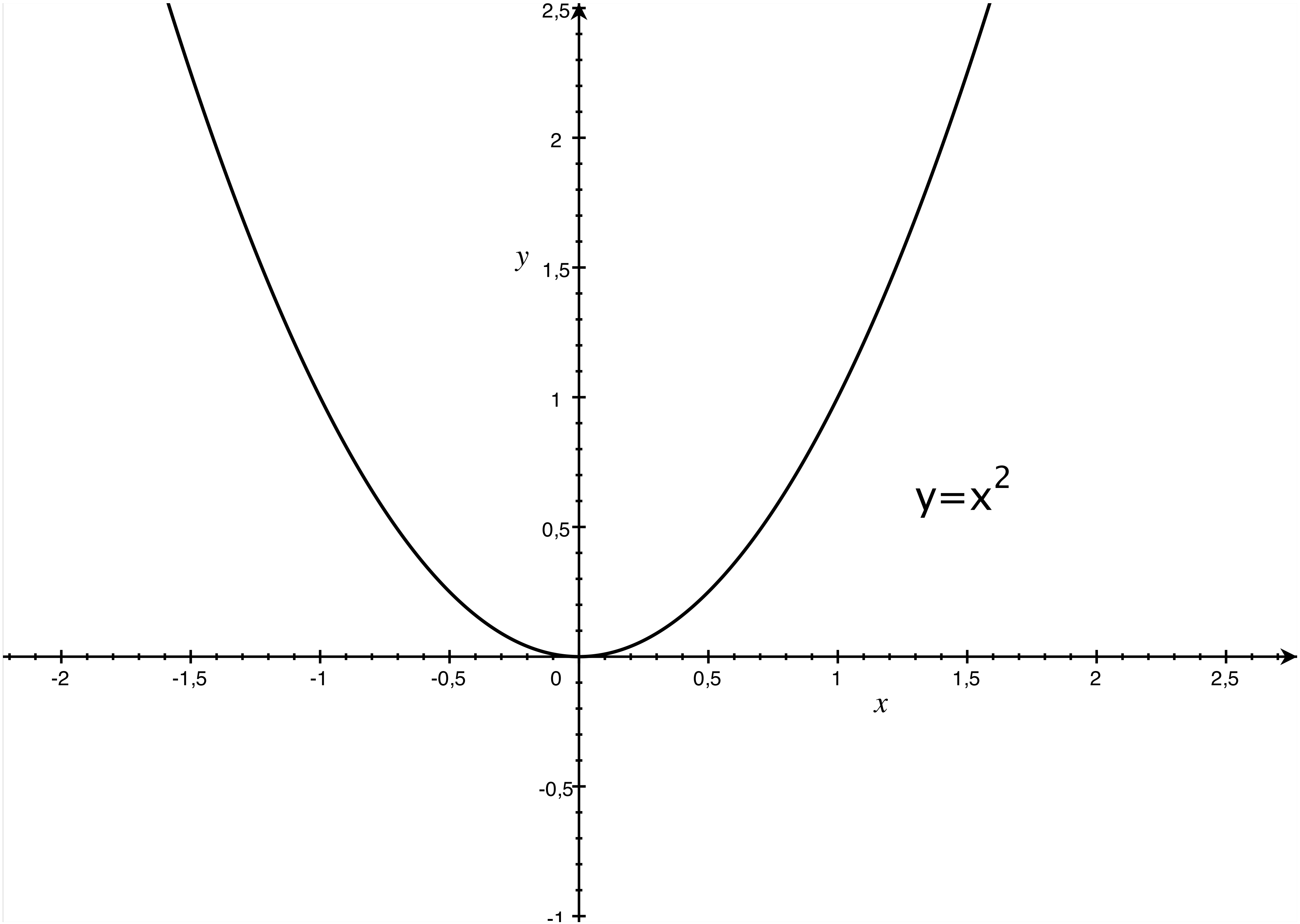
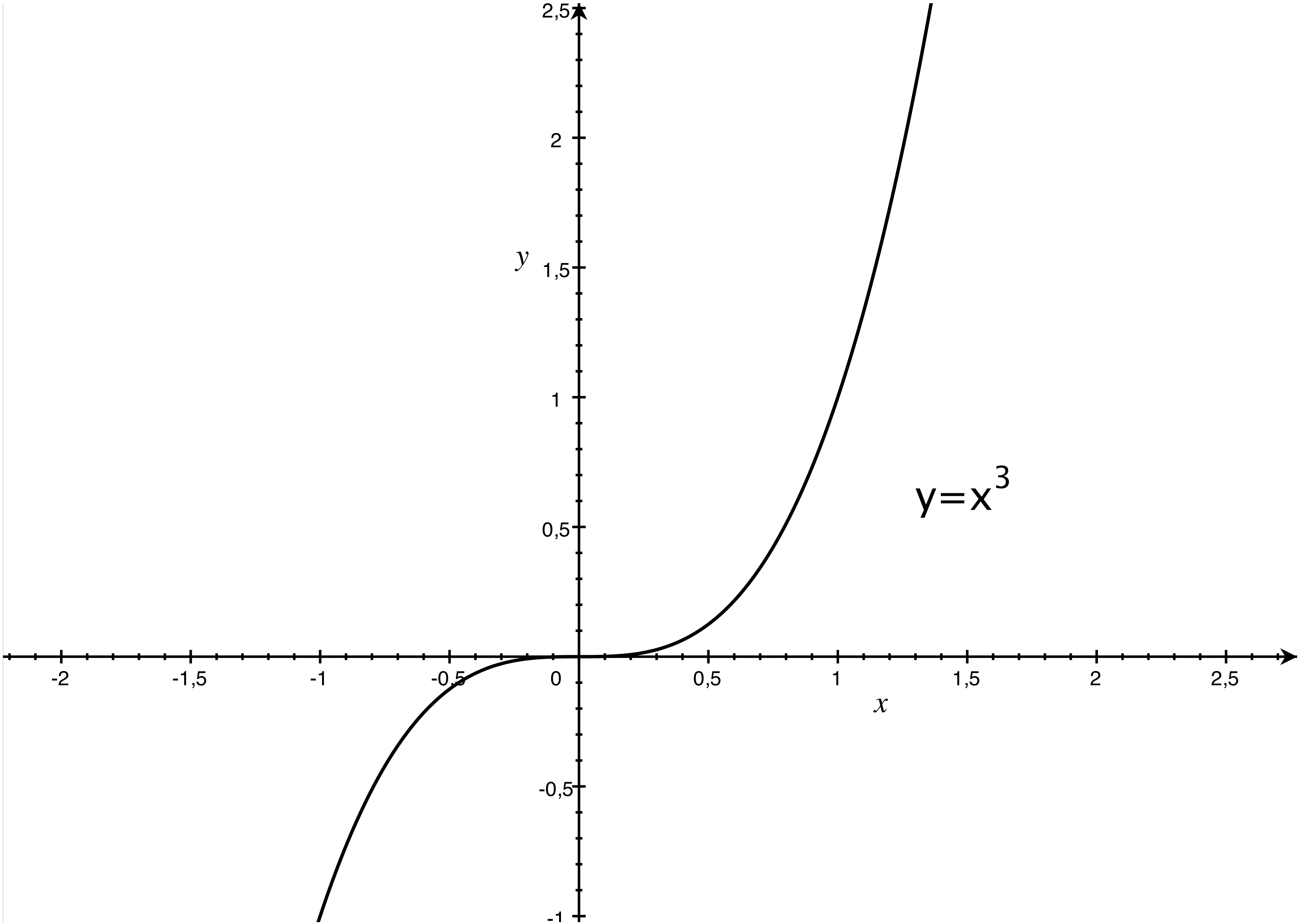
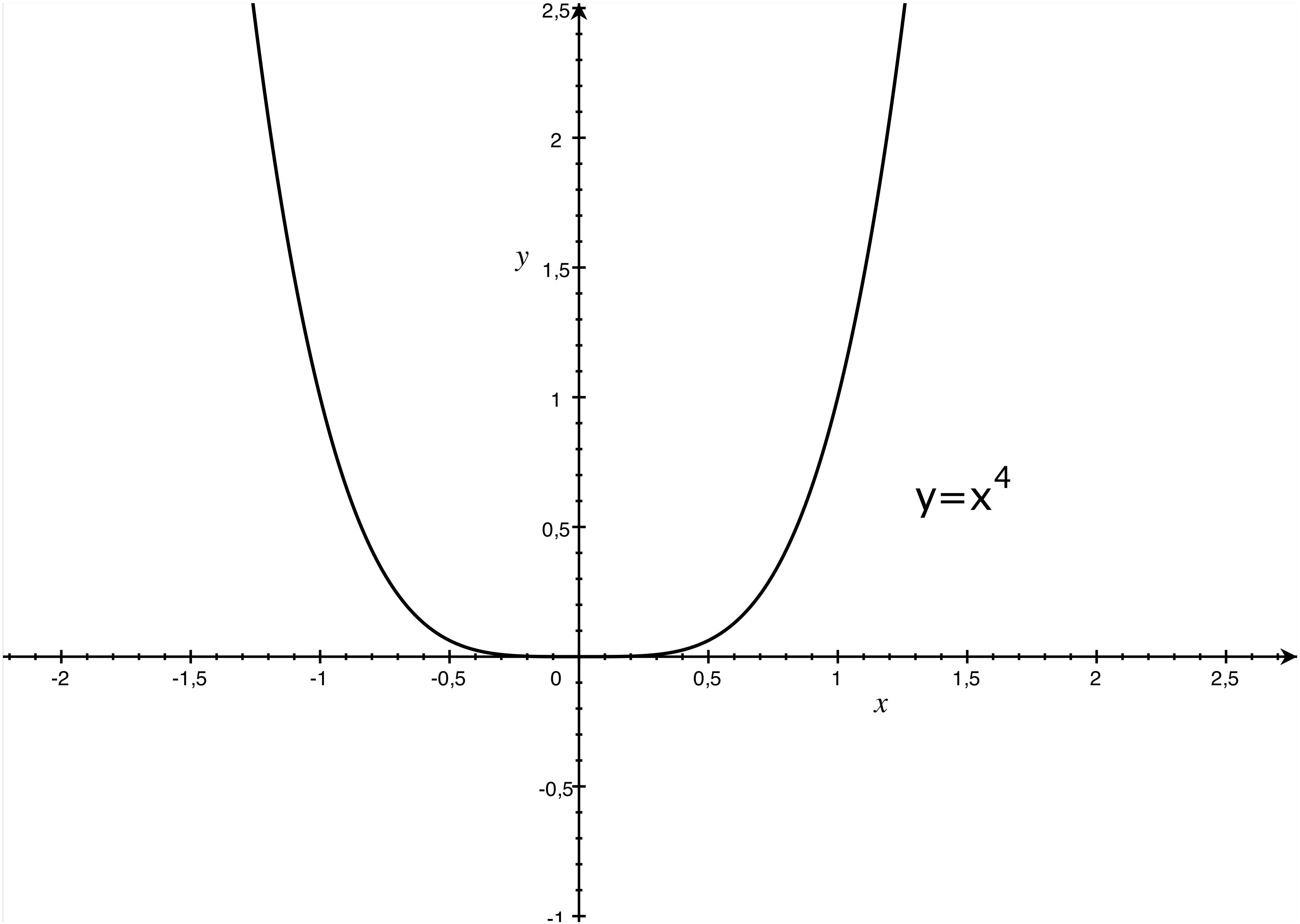
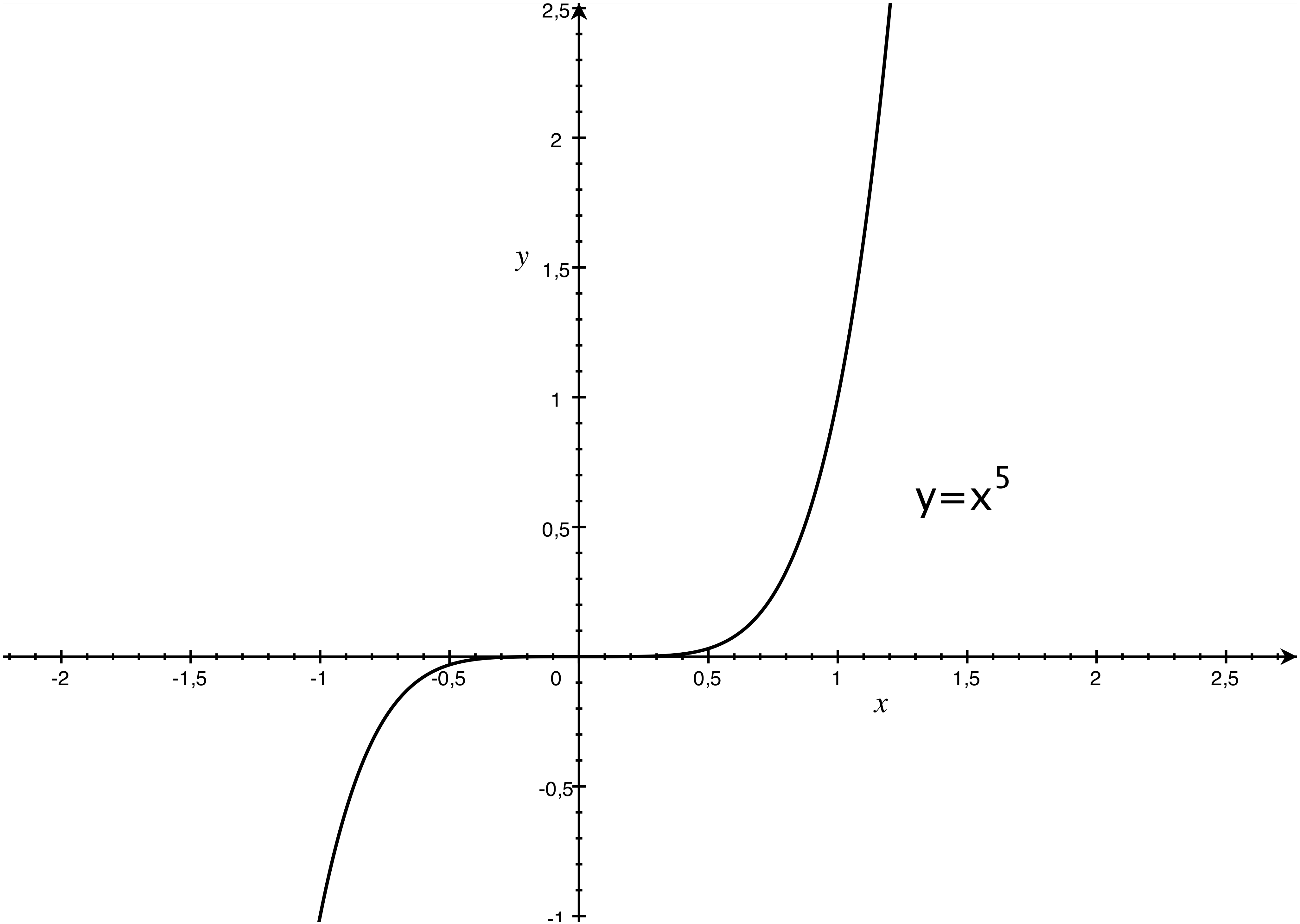

y= - 3x+1
y=x+2
y=x/2 −1
3
2
1
-1
-2
-3
-4
-3
-2
-1
0
1
2
3
4
x
y

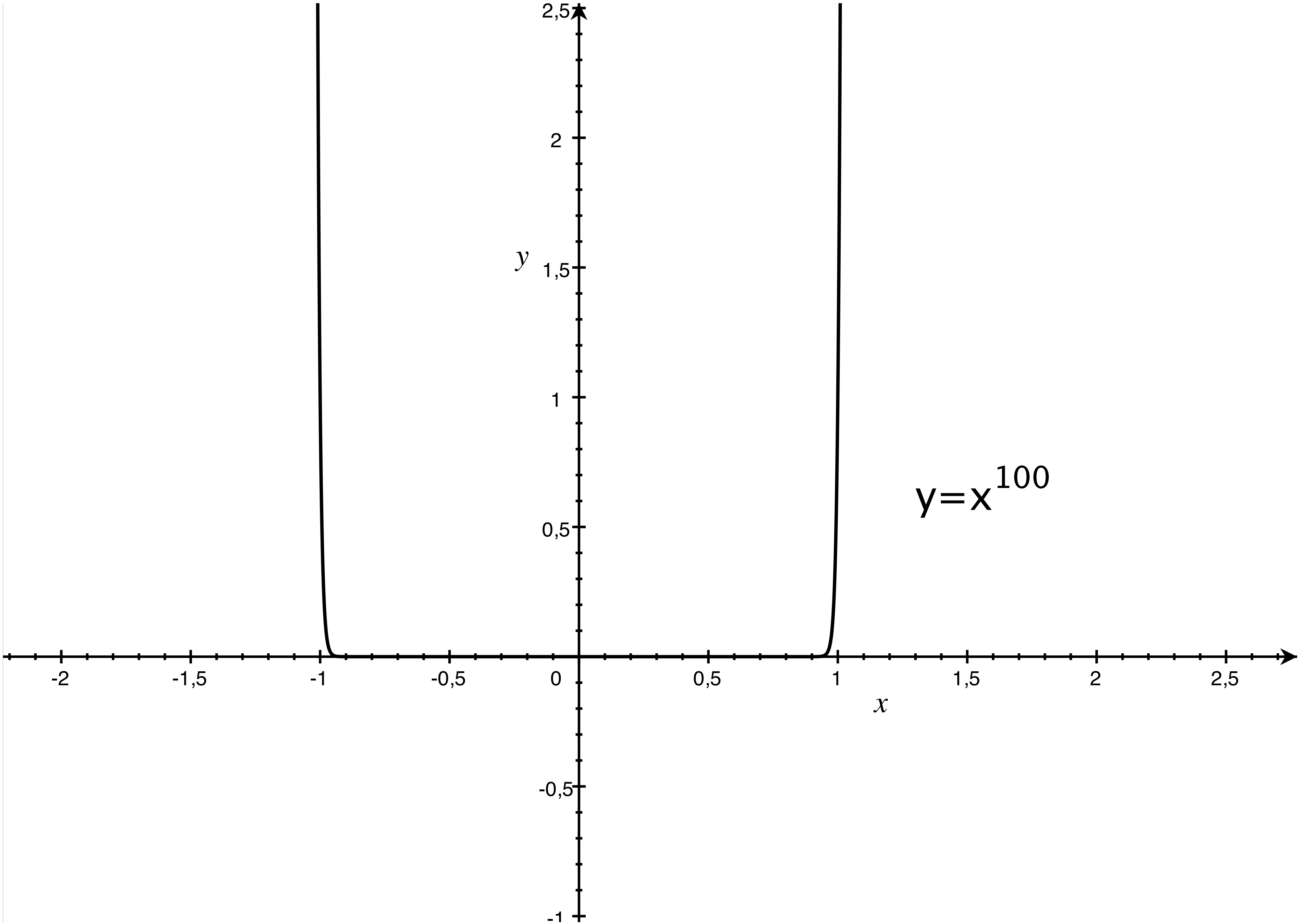


2,5
2
y
1,5
1
y=x2
0,5
-2
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
x
-0,5
-1

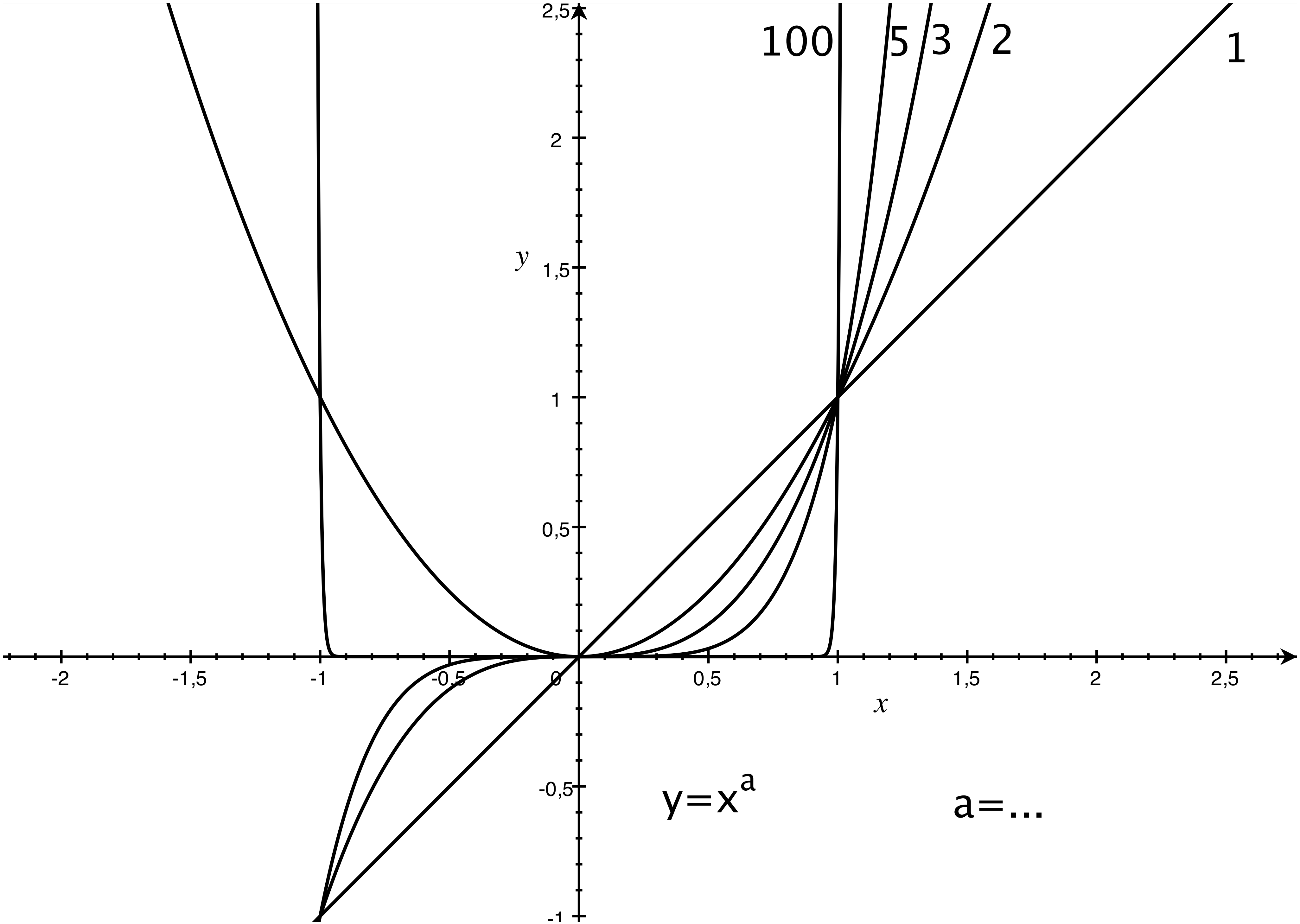

2,5
2
1,5
1
0,5
-0,5
-1
y
-2
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
x
y=x^3


y
x
2,5
2
1,5
1
0,5
-0,5
-1
-2
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
y=x4

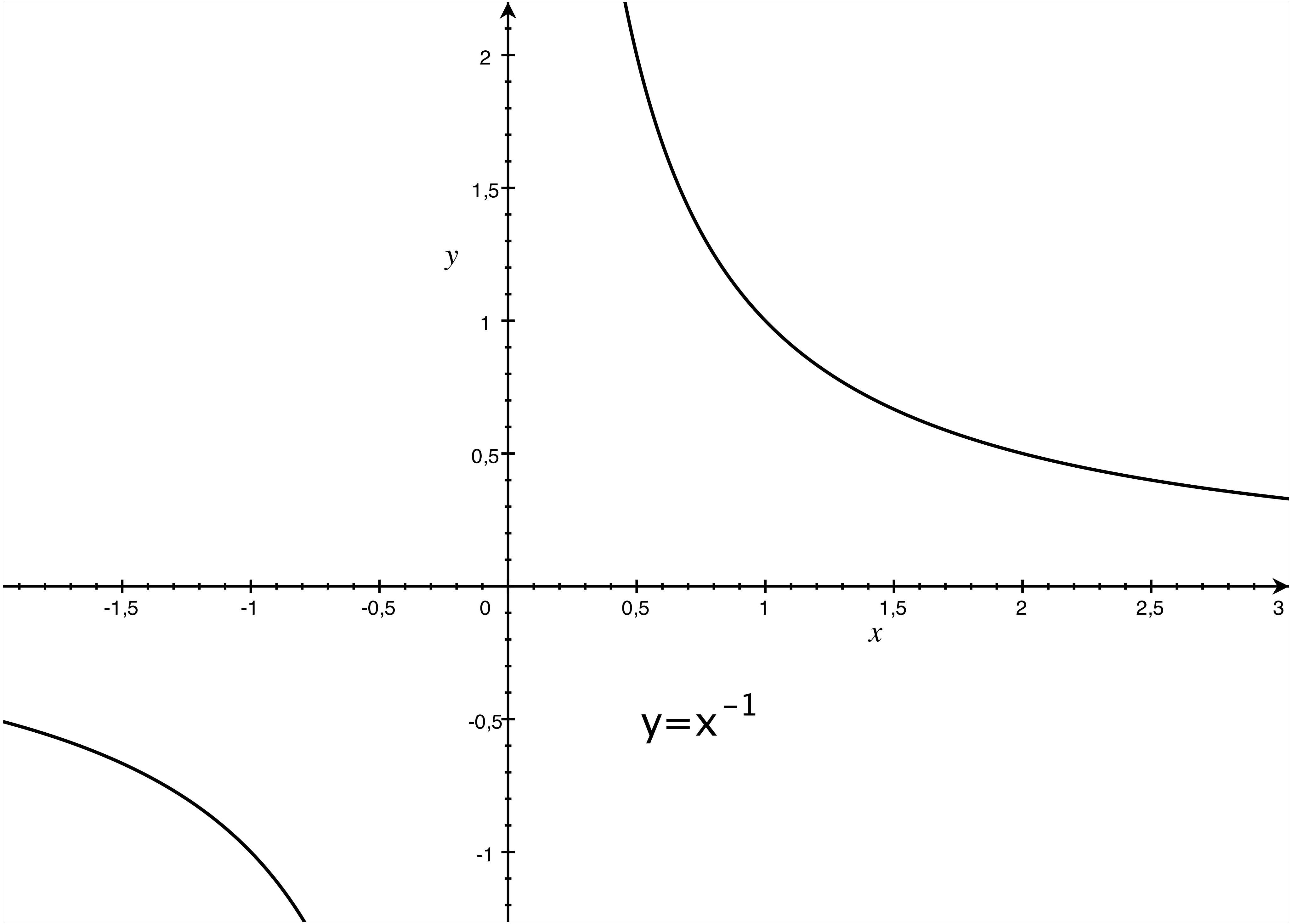

y=x^5
y
x
2,5
2
1,5
1
0,5
-0,5
-1
-2
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5

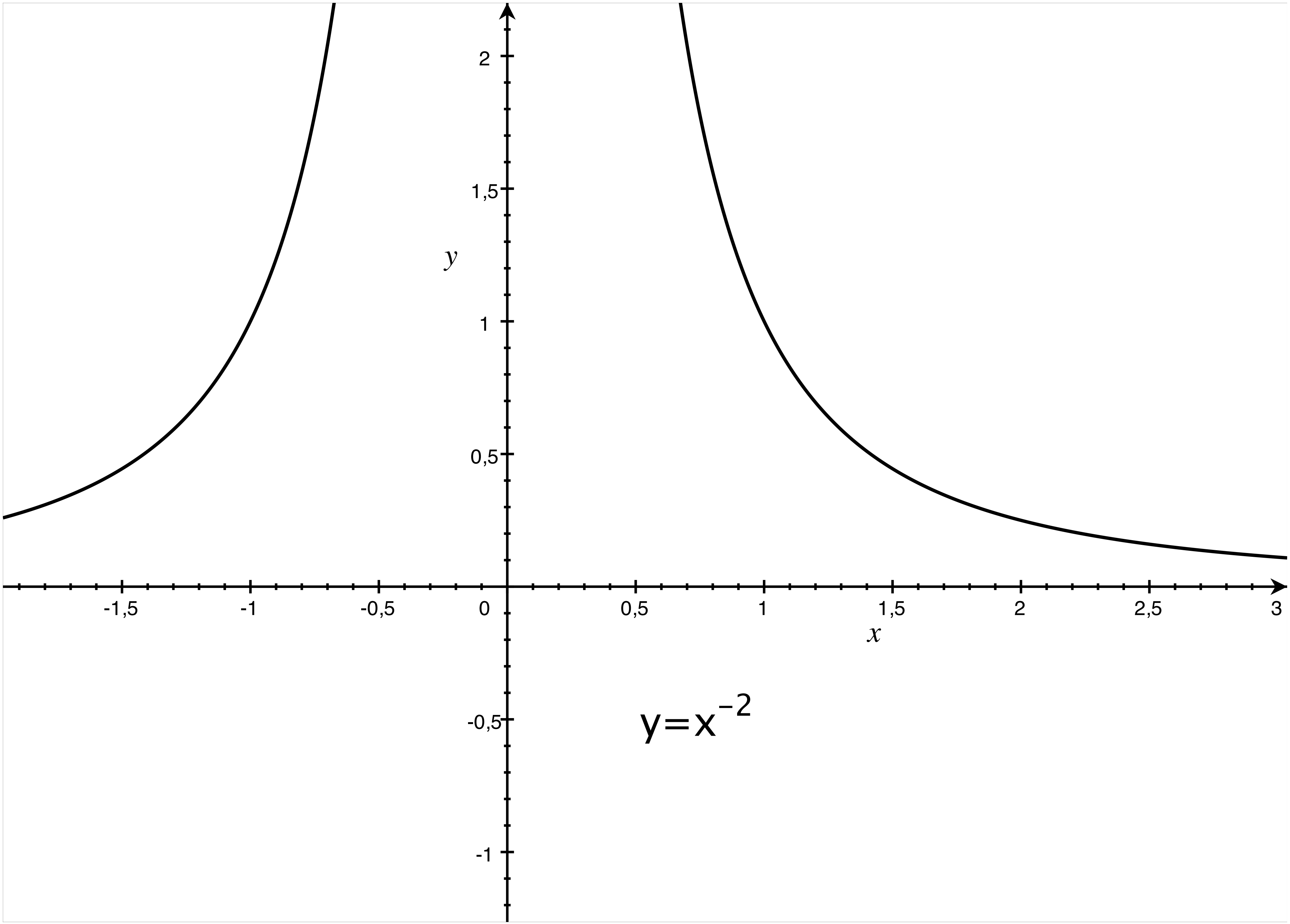


y
2,5
2
1,5
1
0,5
-0,5
-1
-2
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
x
y=x100



100
5
3
2
1
y
x
2,5
2
1,5
1
0,5
-0,5
-1
-2
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
y=x^a
a=...


2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
y=x⁻¹
-1



2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
-1
y=x^−2

Proprietà Per ogni $a, b \in \mathbb{R}^+$ e $r, s \in \mathbb{Q}$ risulta:

1) $a^{r+s} = a^r \cdot a^s$;

2) $(ab)^r = a^r \cdot b^r$;

3) $(a^r)^s = a^{rs}$;

4) $a^{-r} = \dfrac{1}{a^r}$;

5) $a^r > 0, \quad a^0 = 1, \quad 1^r = 1$;

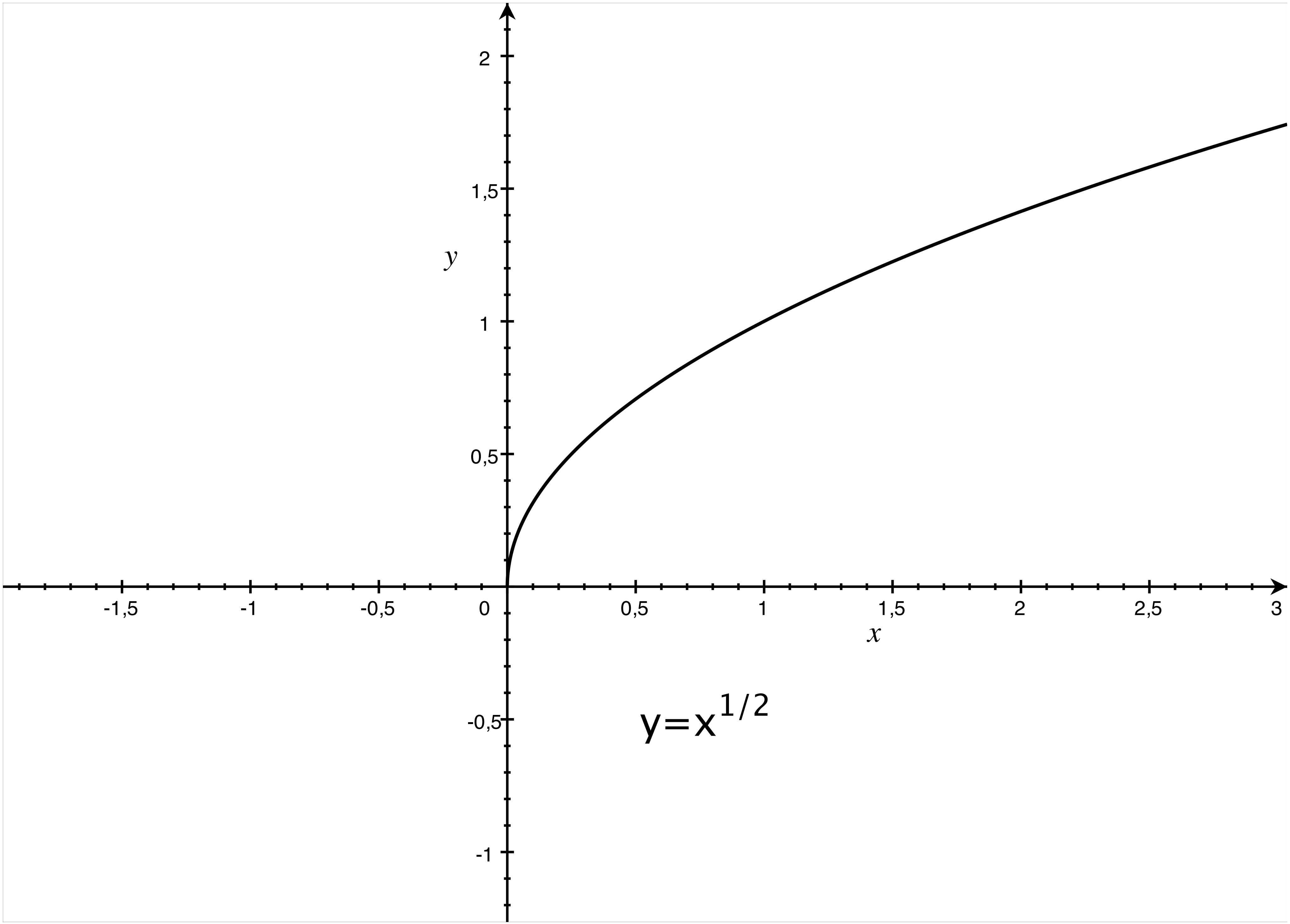
6) $\begin{cases} a^r > 1 & \text{se } \ a > 1 \ \text{ e } \ r > 0, \ \text{oppure se } \ a < 1 \text{ e } r < 0 \\ a^r < 1 & \text{se } \ a < 1 \ \text{ e } \ r > 0, \ \text{oppure se } \ a > 1 \text{ e } r < 0; \end{cases}$

7) $r < s \Rightarrow \begin{cases} a^r < a^s & \text{se } a > 1 \\ a^r > a^s & \text{se } a < 1; \end{cases}$

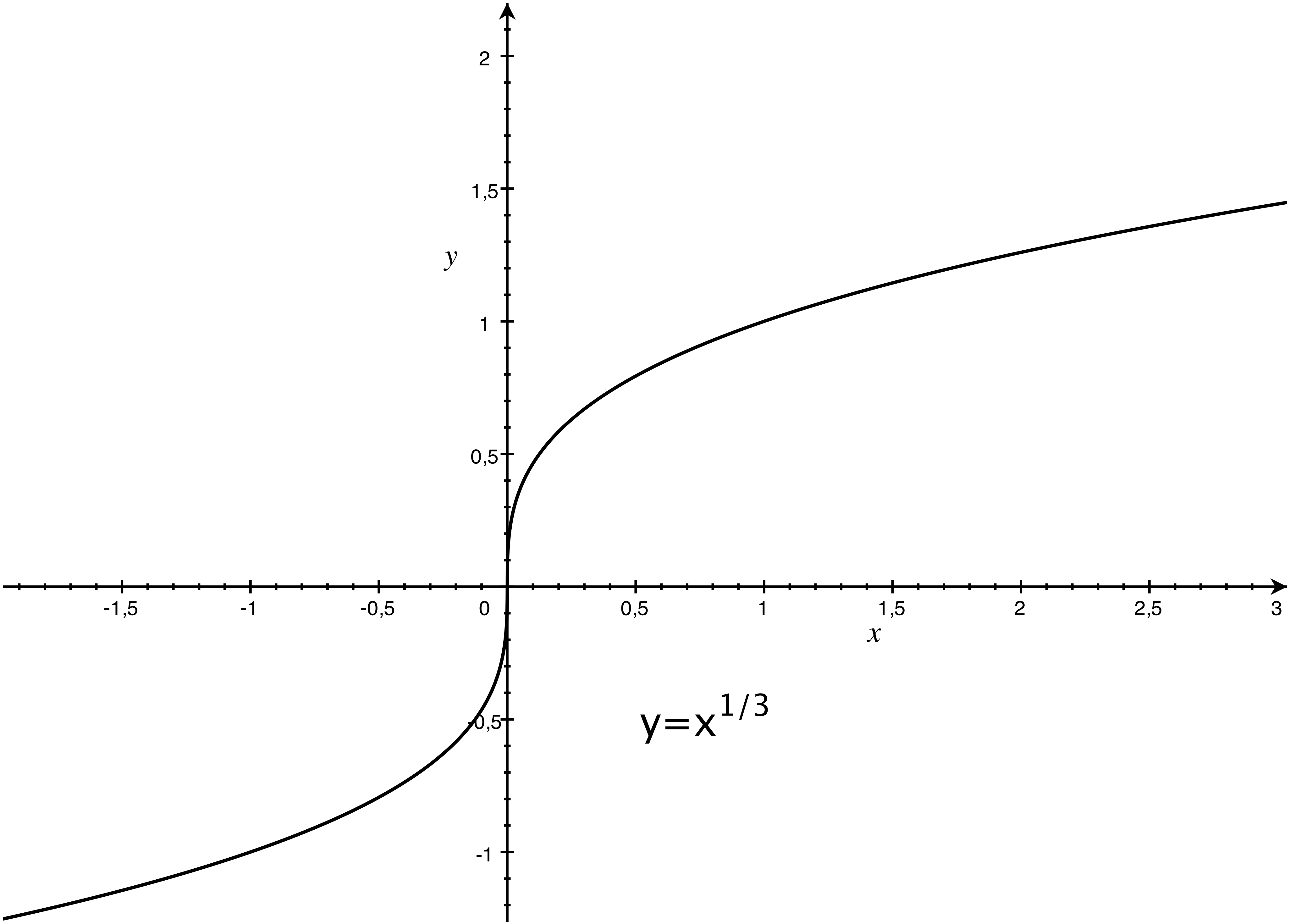
8) $0 < a \leq b \Rightarrow \begin{cases} a^r \leq b^r & \text{se } r > 0 \\ a^r \geq b^r & \text{se } r < 0 \end{cases}$

9) $\forall a \neq 1: \quad a^r = a^s \Rightarrow r = s$

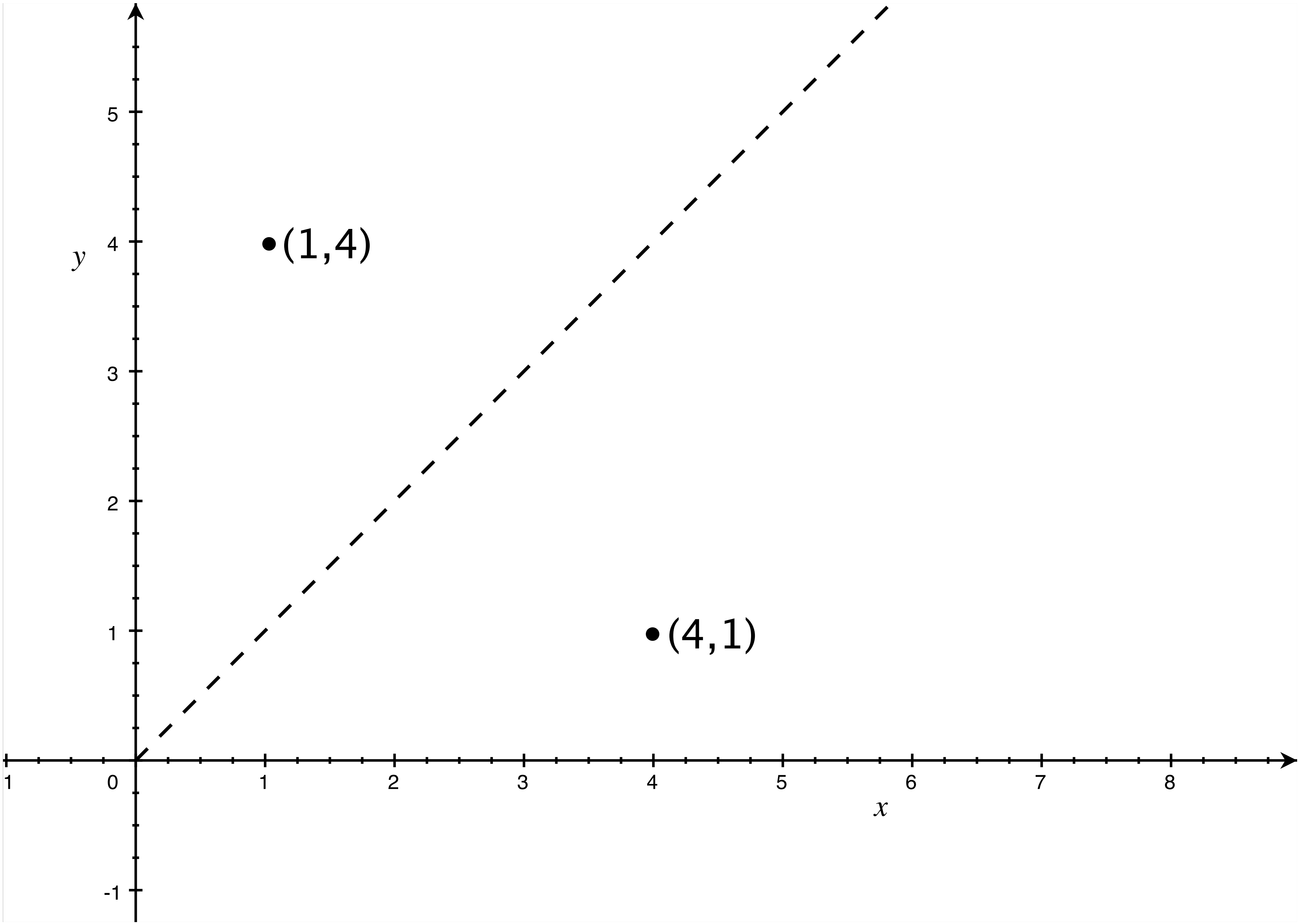
(la 9) è una facile conseguenza della 7)).



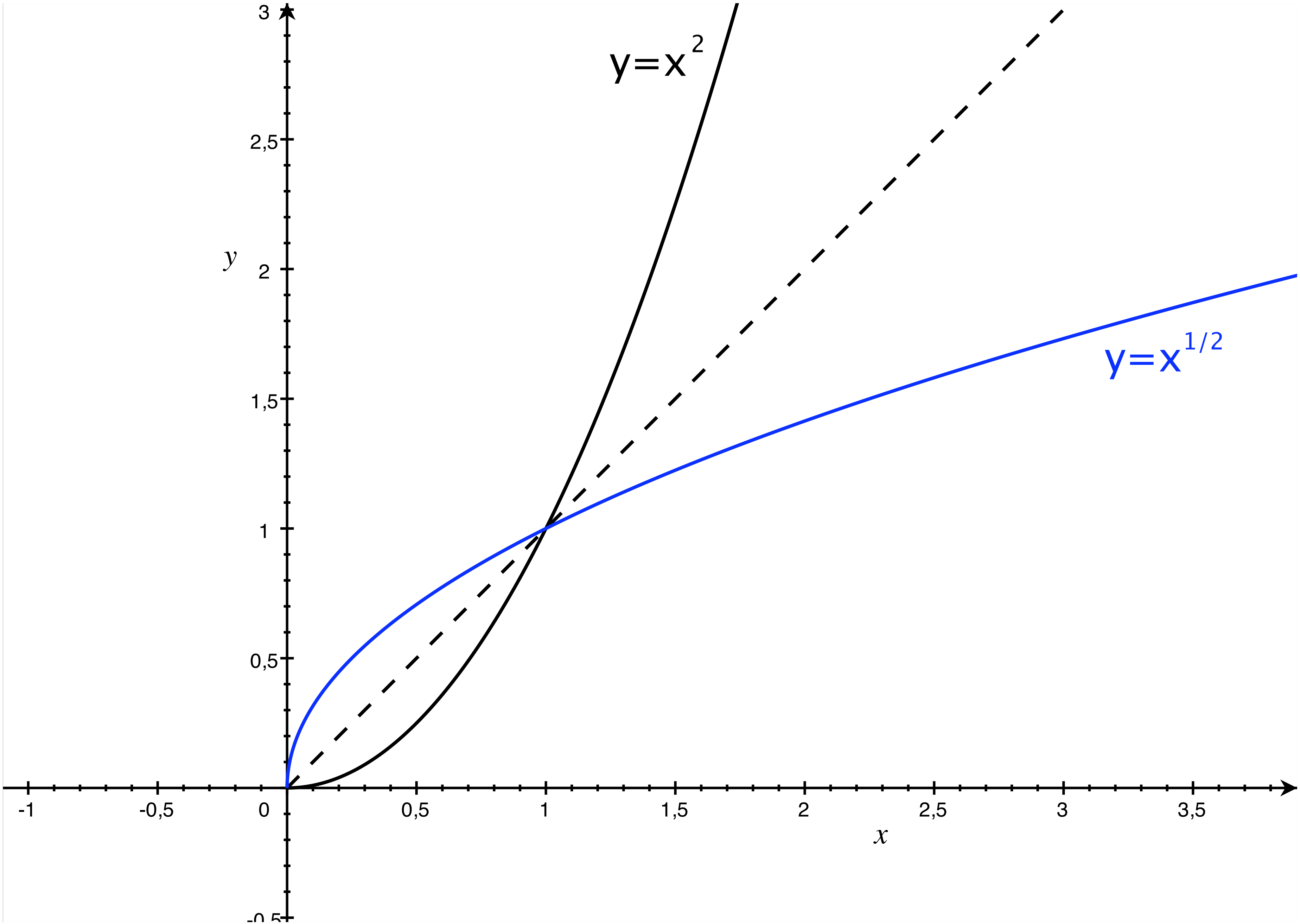
2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
-1
y=x^{1/2}

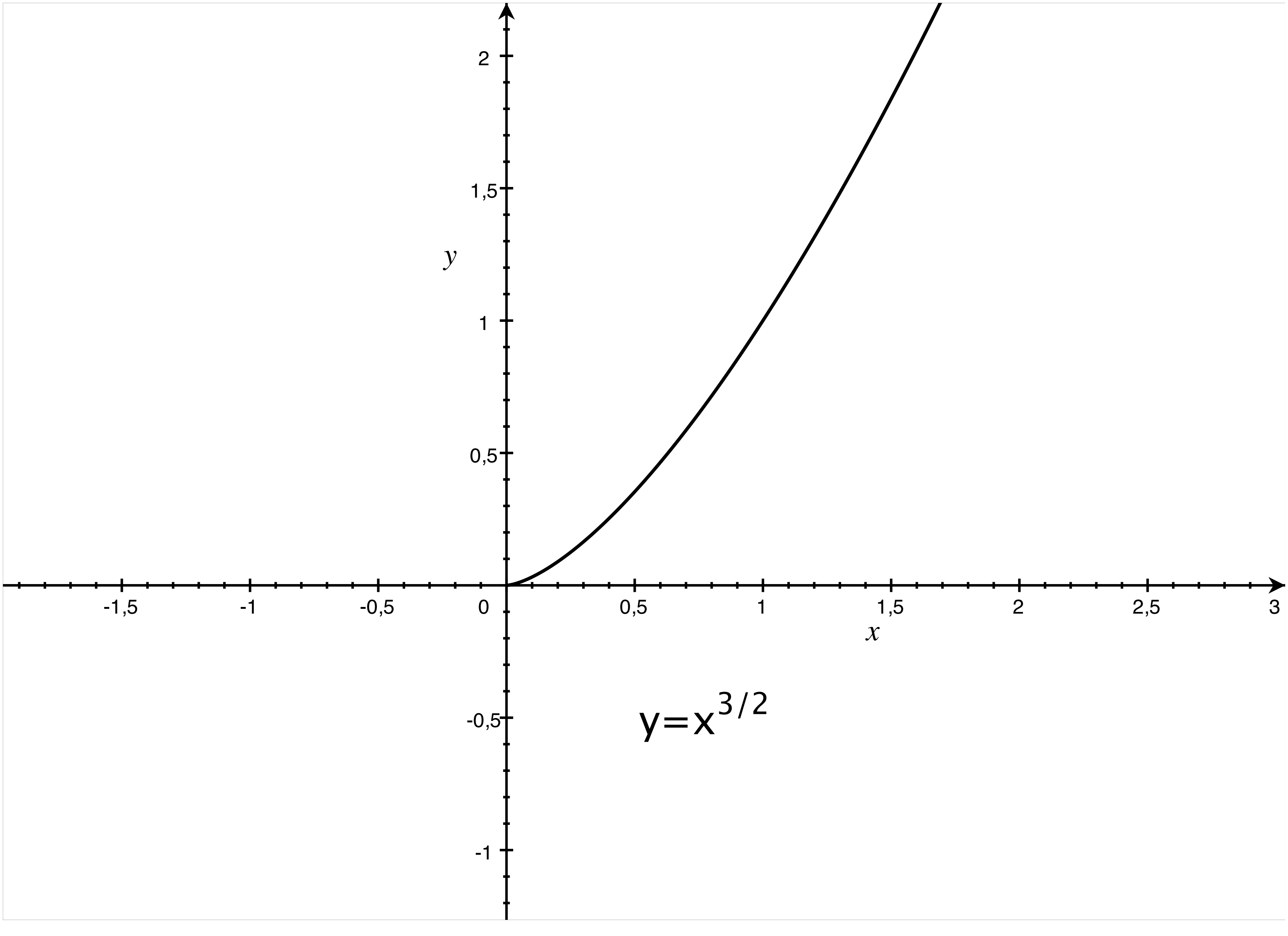


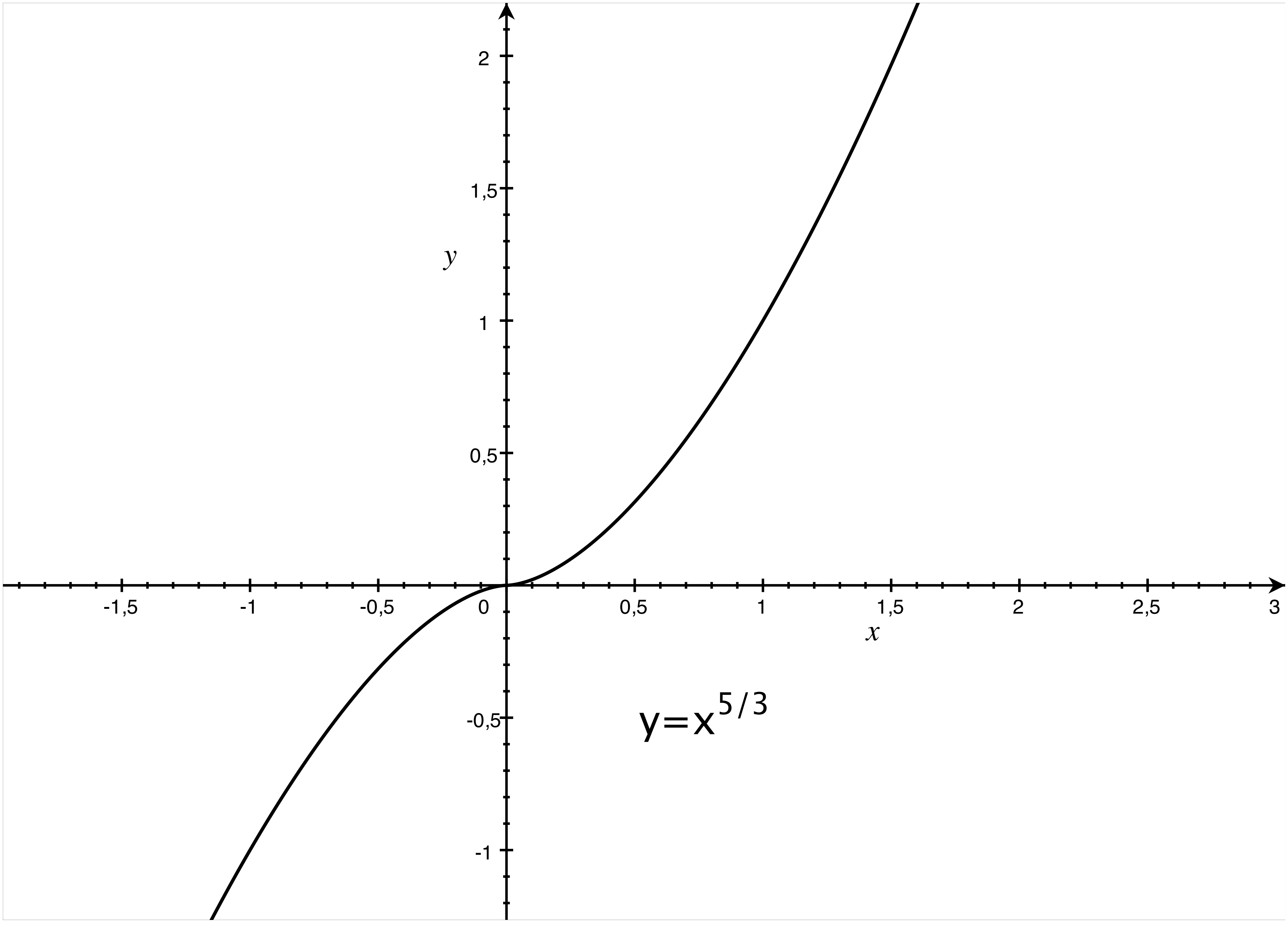
2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
-1
y=x1/3



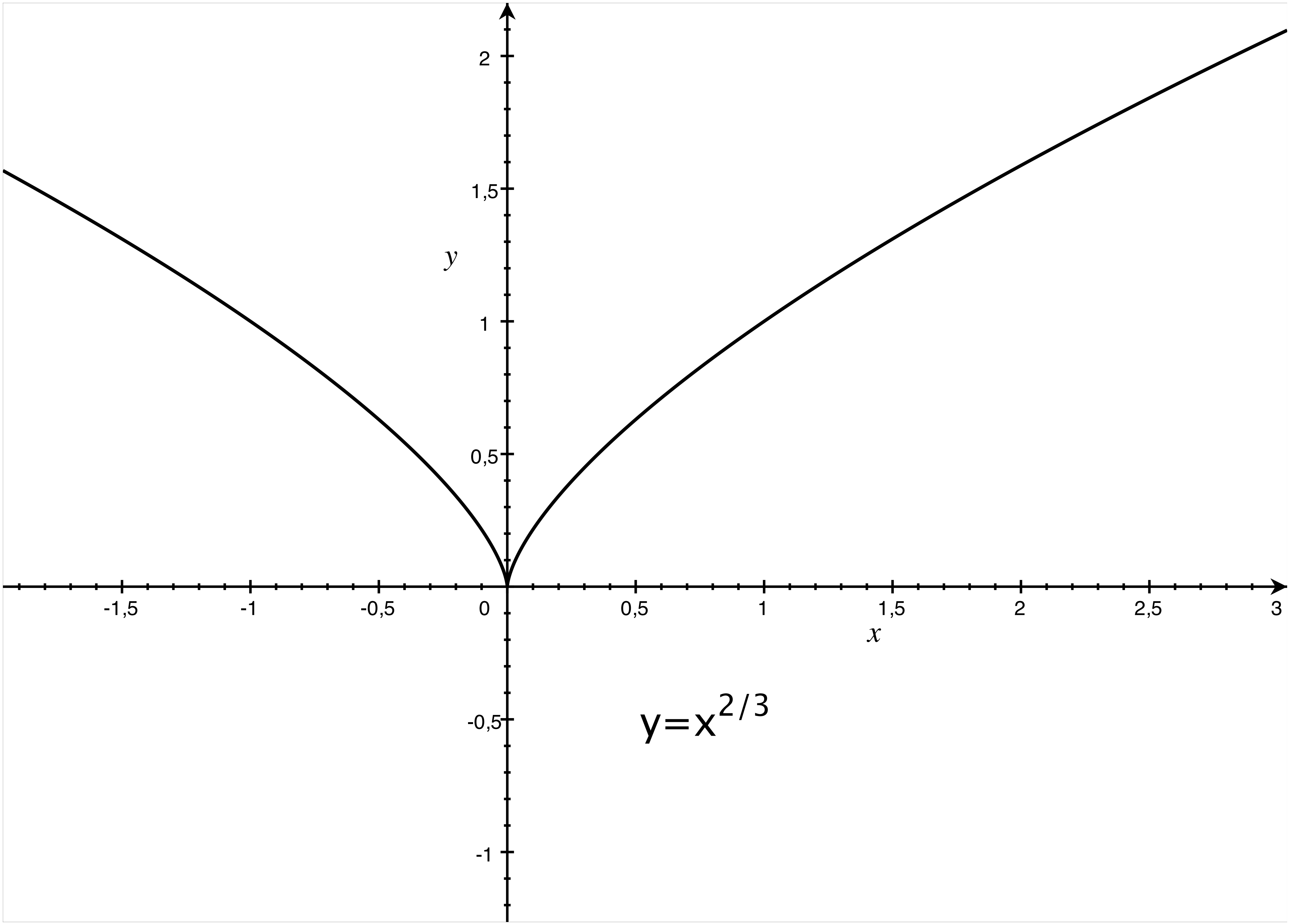
y
x
(1,4)
(4,1)
5
4
3
2
1
-1
1
0
1
2
3
4
5
6
7
8

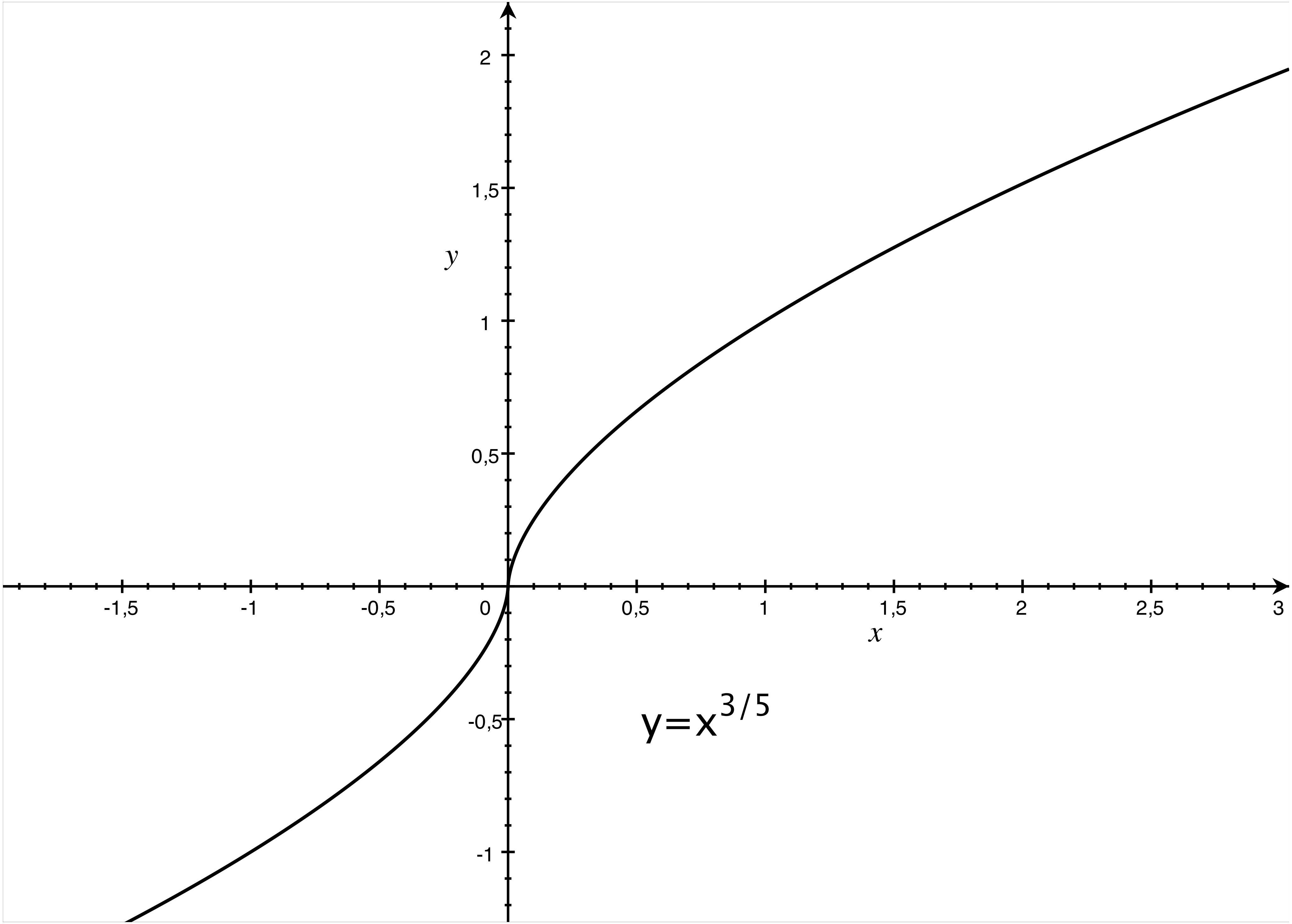

y=x^2
y=x^1/2
y
x
3
2,5
2
1,5
1
0,5
-0,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
3,5


2
1,5
1
0,5
-0,5
-1
y
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
y=x^{3/2}

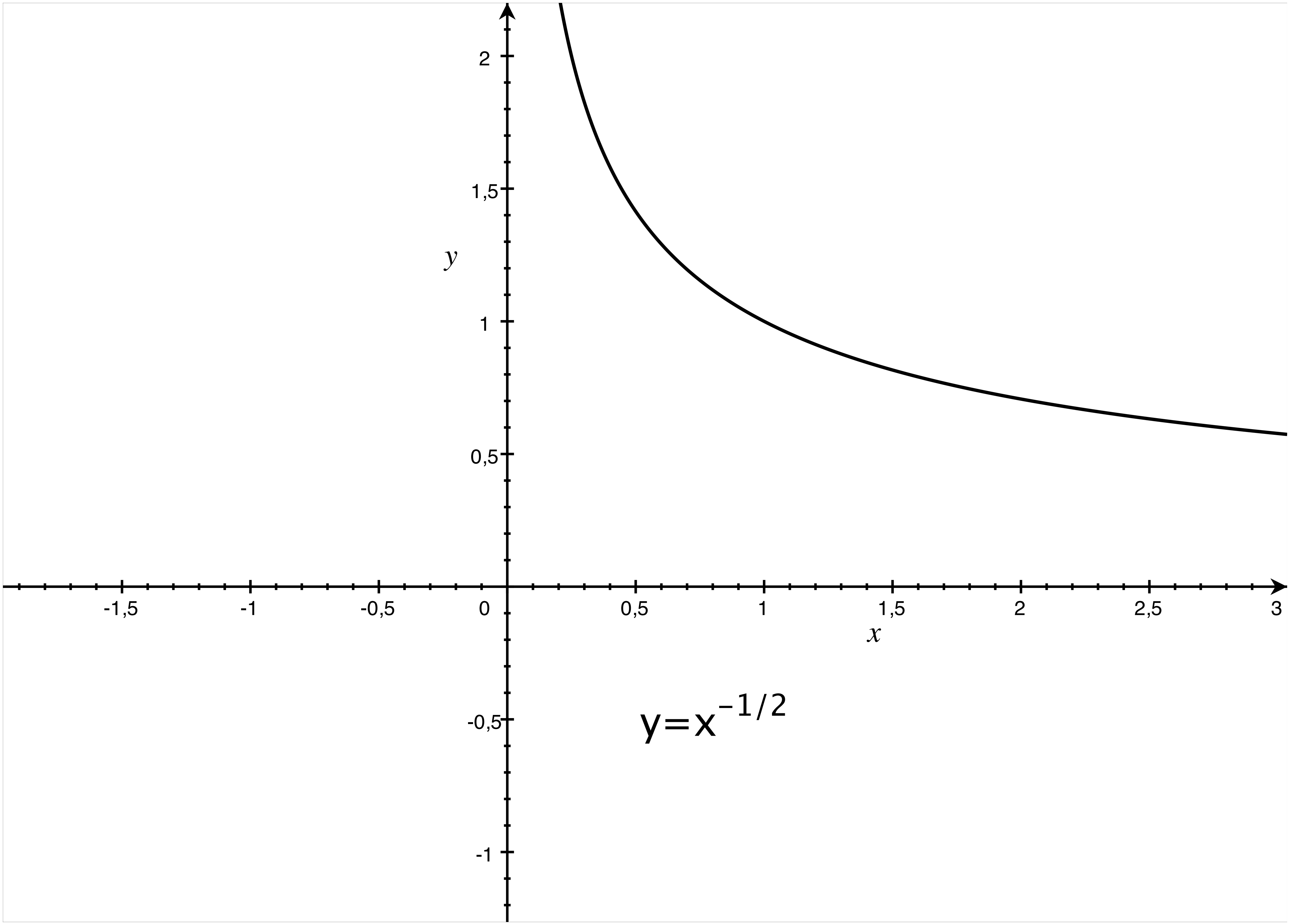


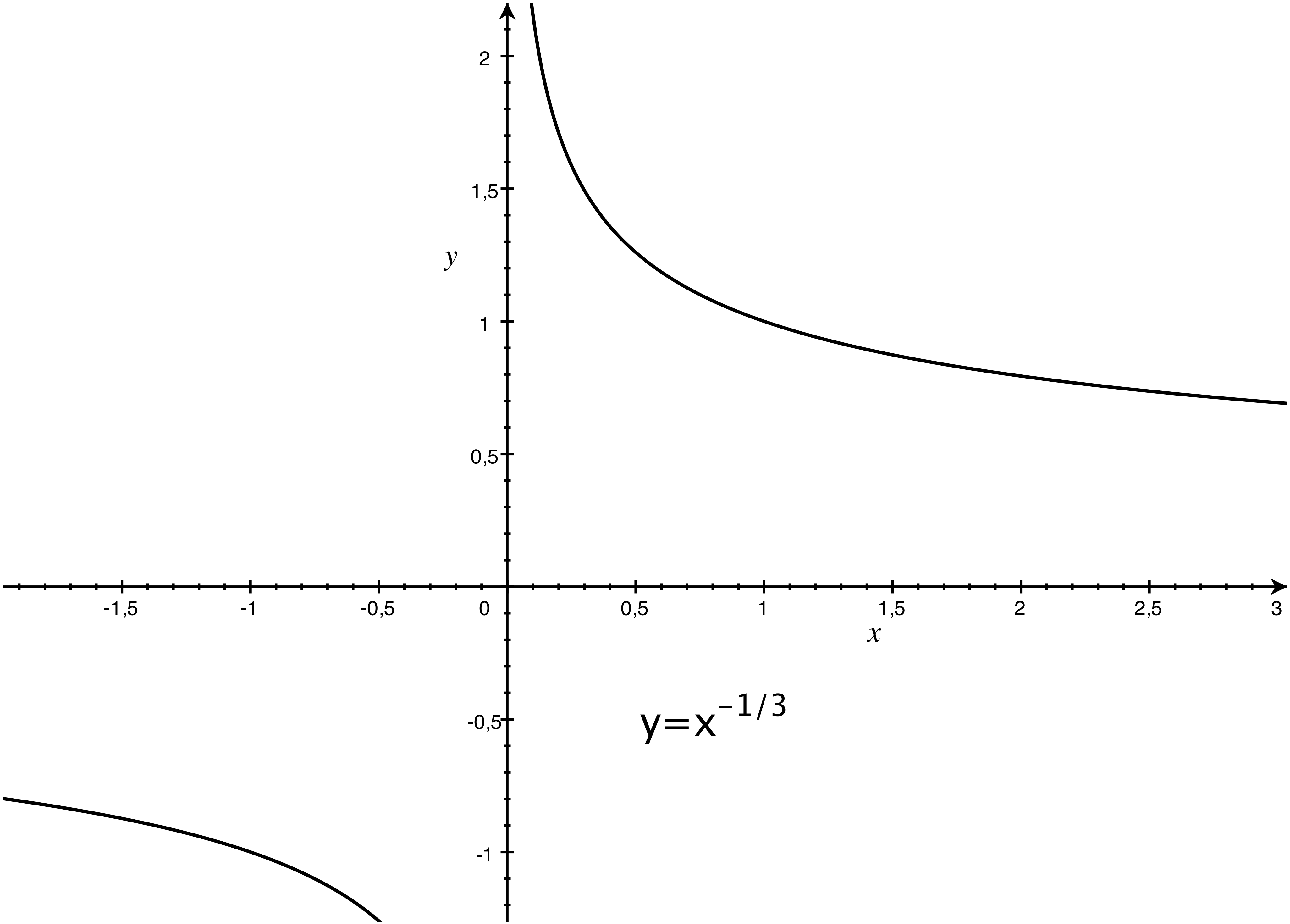
y
x
2
1,5
1
0,5
-0,5
-1
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
y=x^{5/3}


2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
-1
y=x2/3

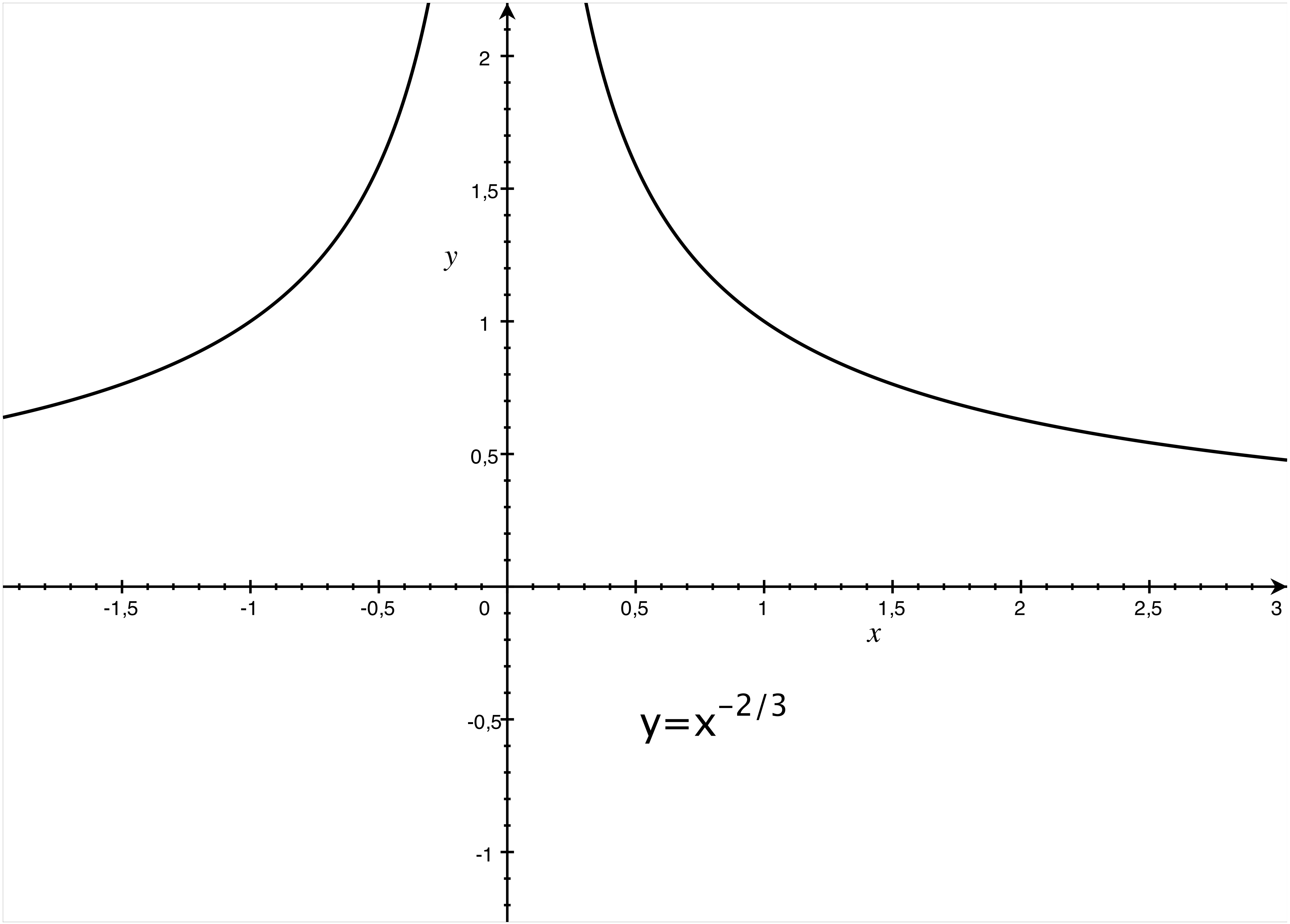


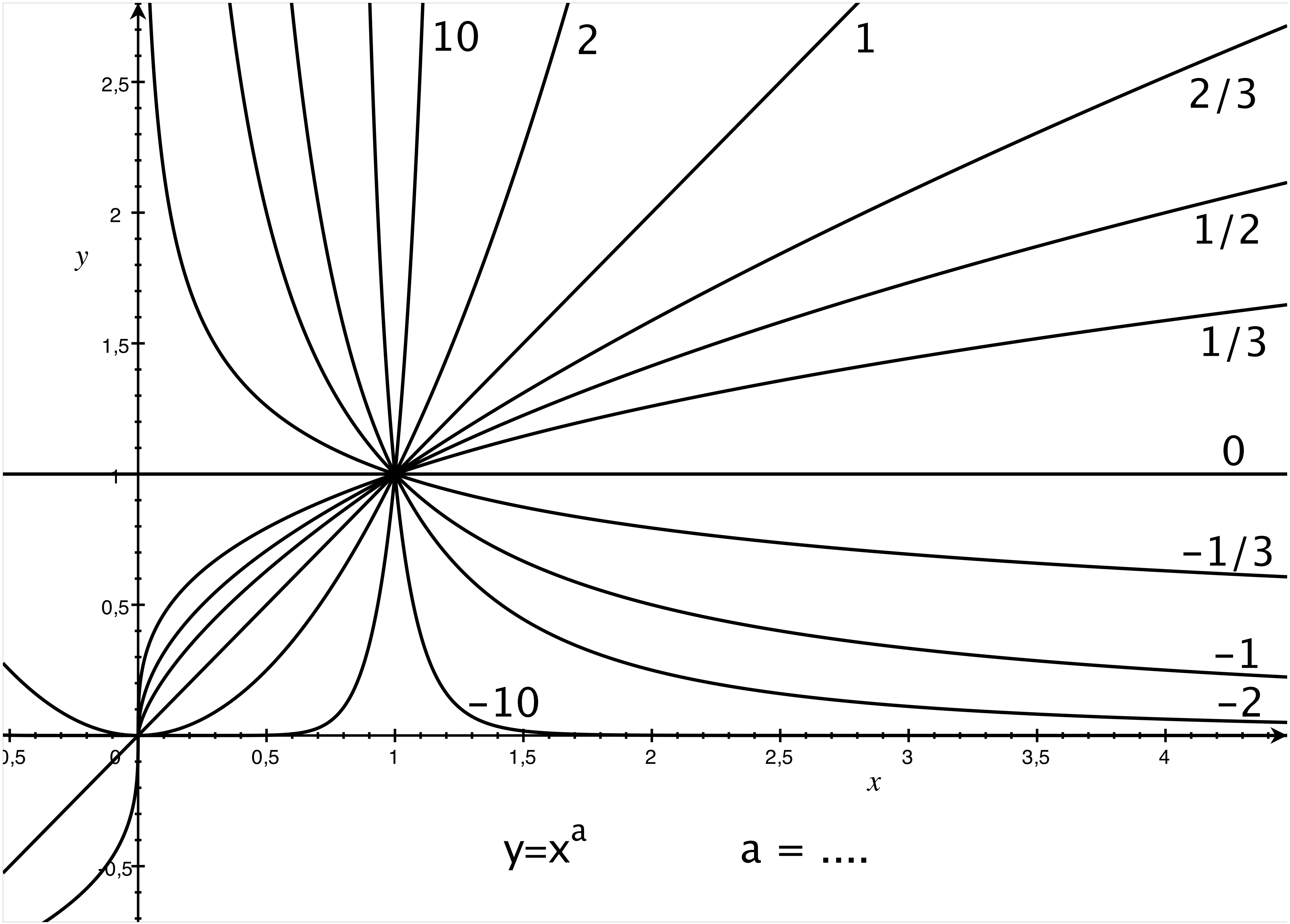
2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
-1
y=x3/5

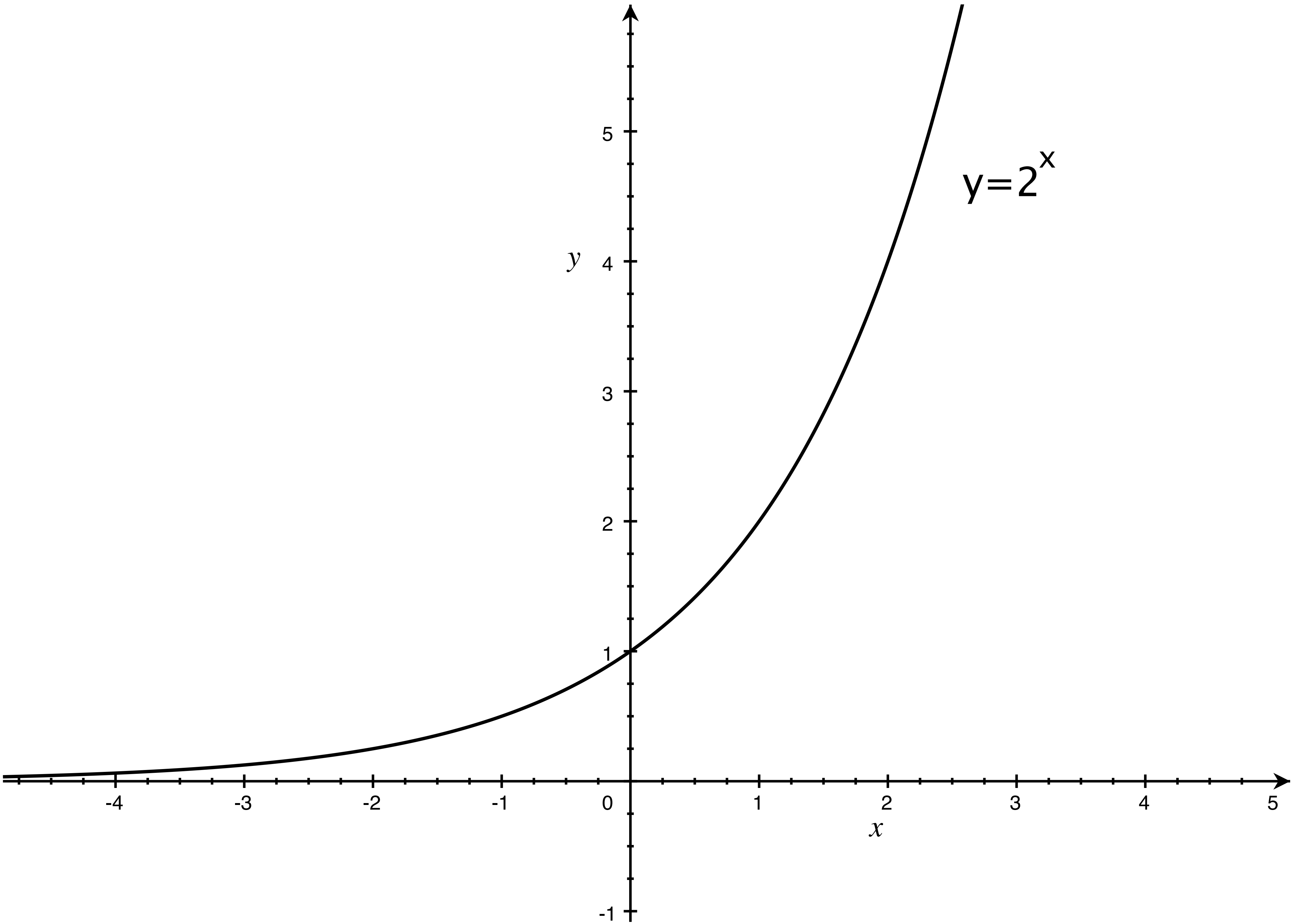

2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
-1
y=x^{-1/2}

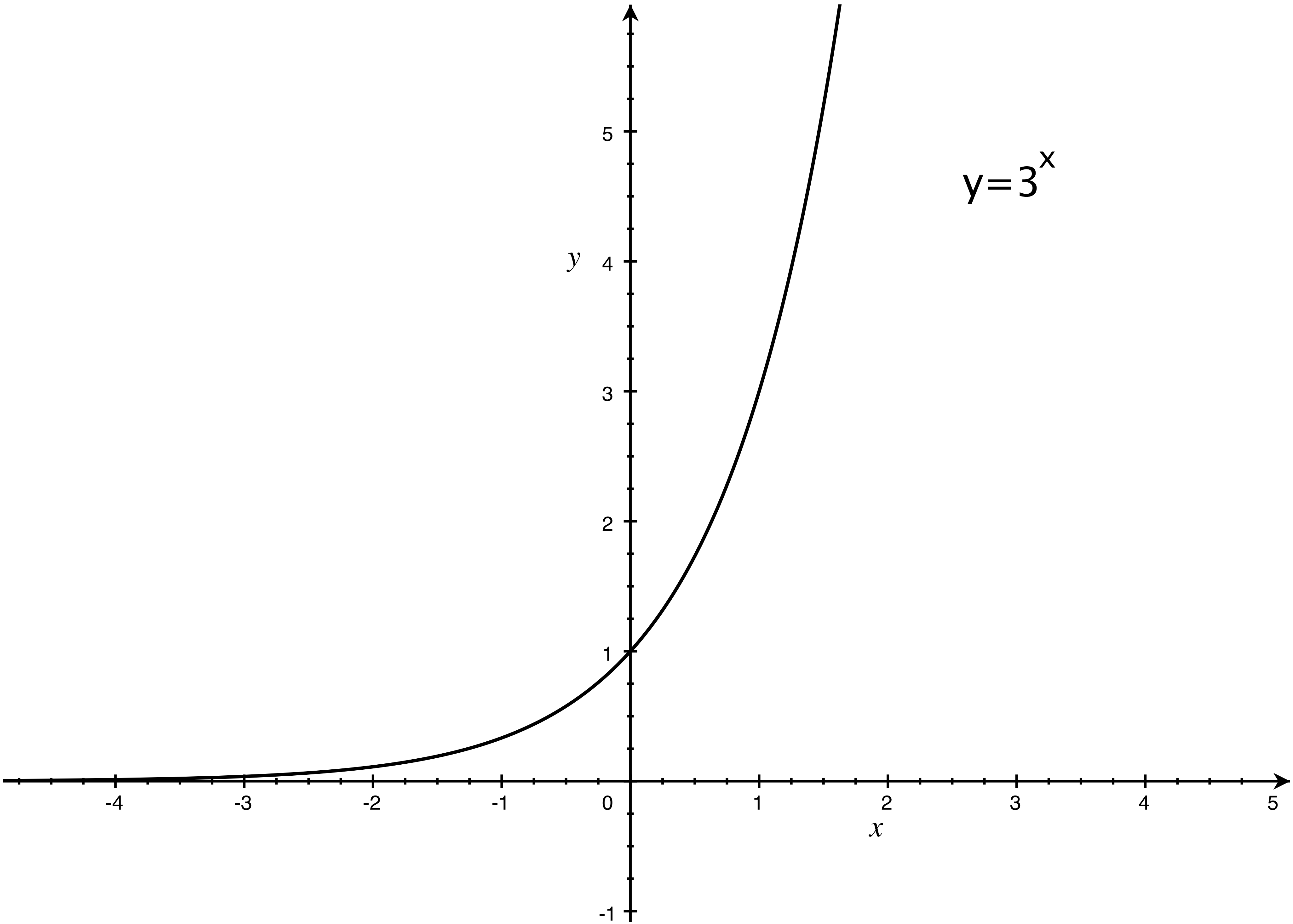


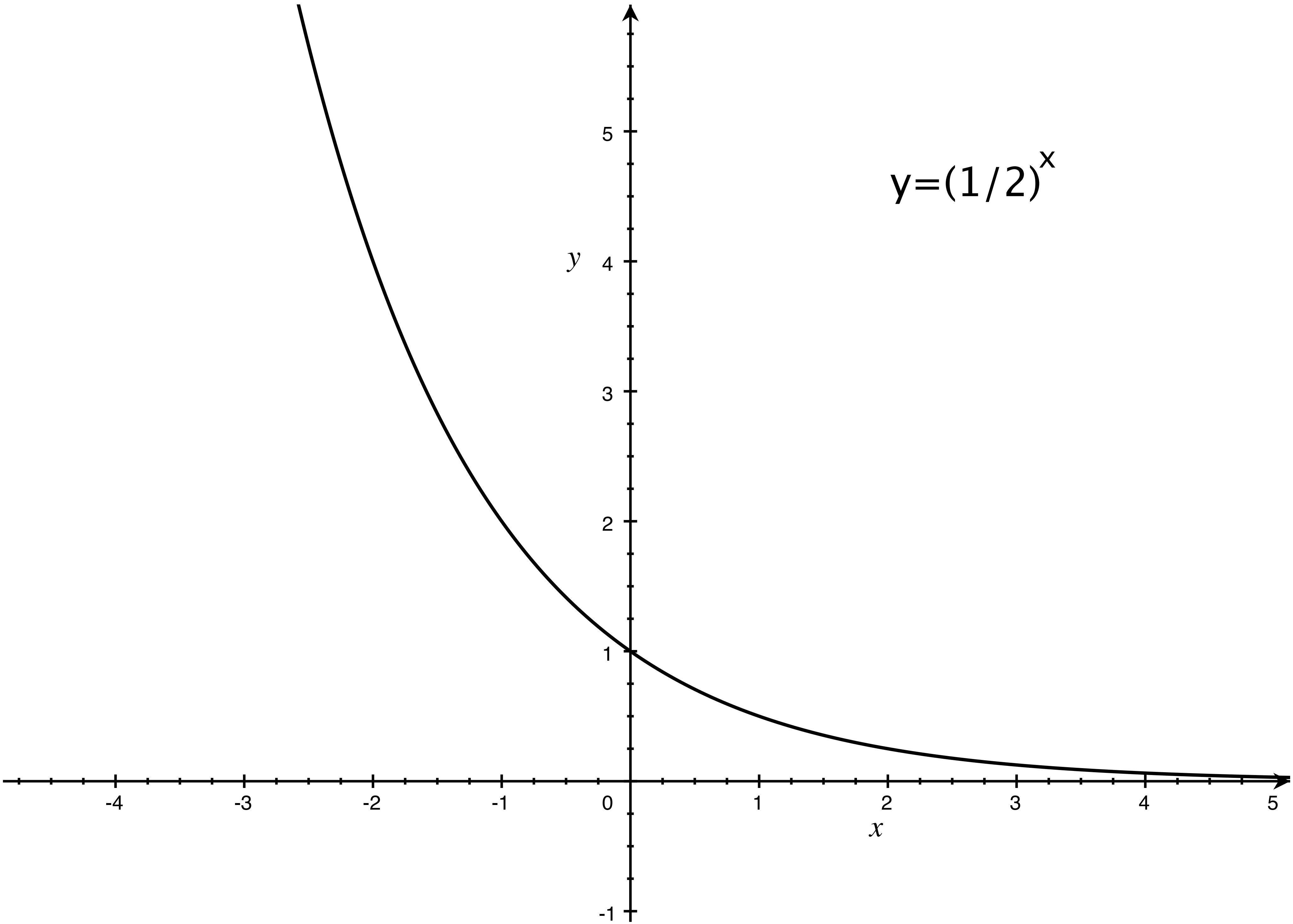
2
1,5
y
1
0,5
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
x
-0,5
y=x$^{-1/3}$
-1


y
x
2
1,5
1
0,5
-0,5
-1
-1,5
-1
-0,5
0
0,5
1
1,5
2
2,5
3
y=x^{−2/3}

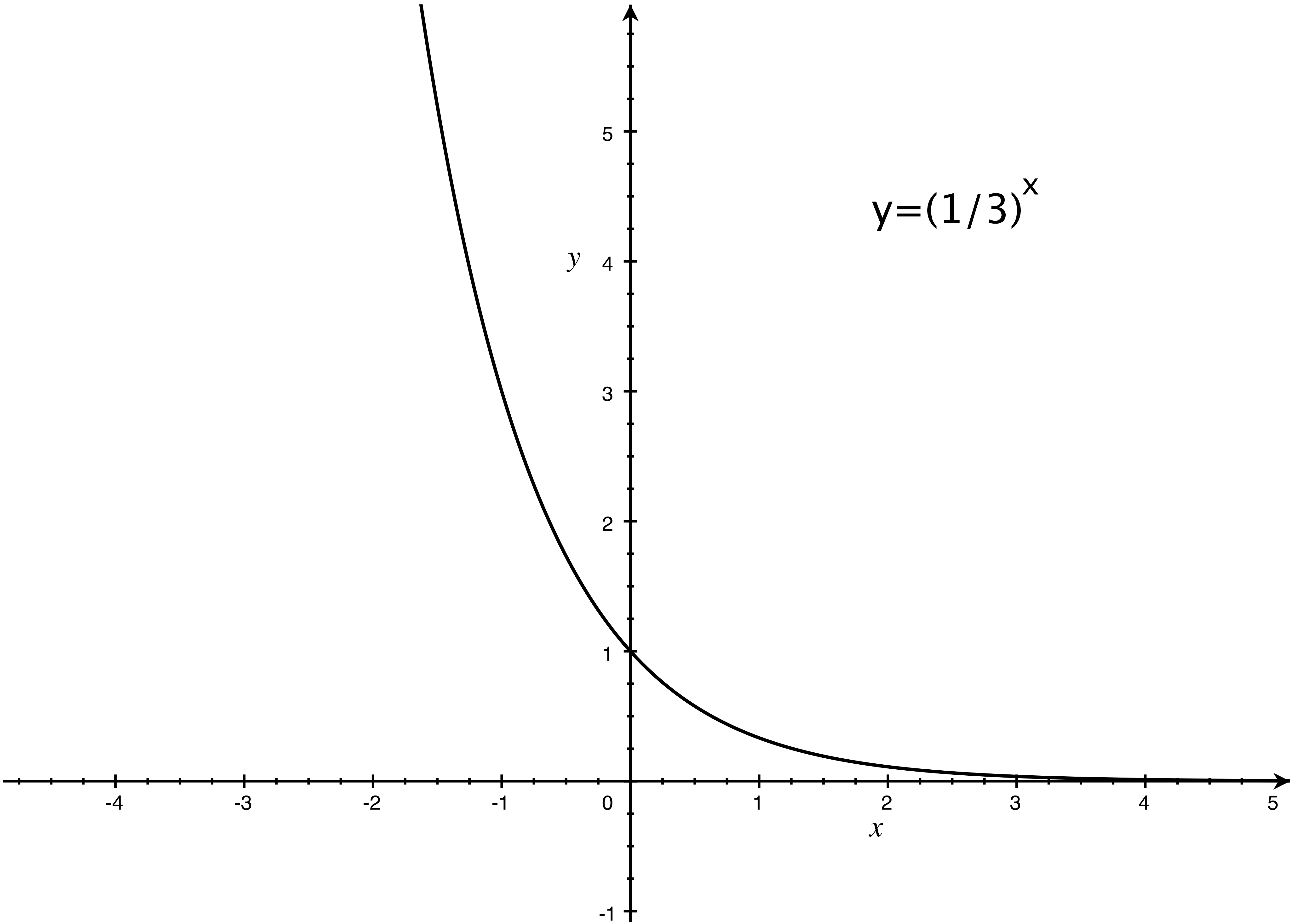

10
2
1
2/3
1/2
1/3
0
−1/3
−1
−2
−10
y
x
2,5
2
1,5
1
0,5
-0,5
0,5
0
0,5
1
1,5
2
2,5
3
3,5
4
y=x^a
a = ...

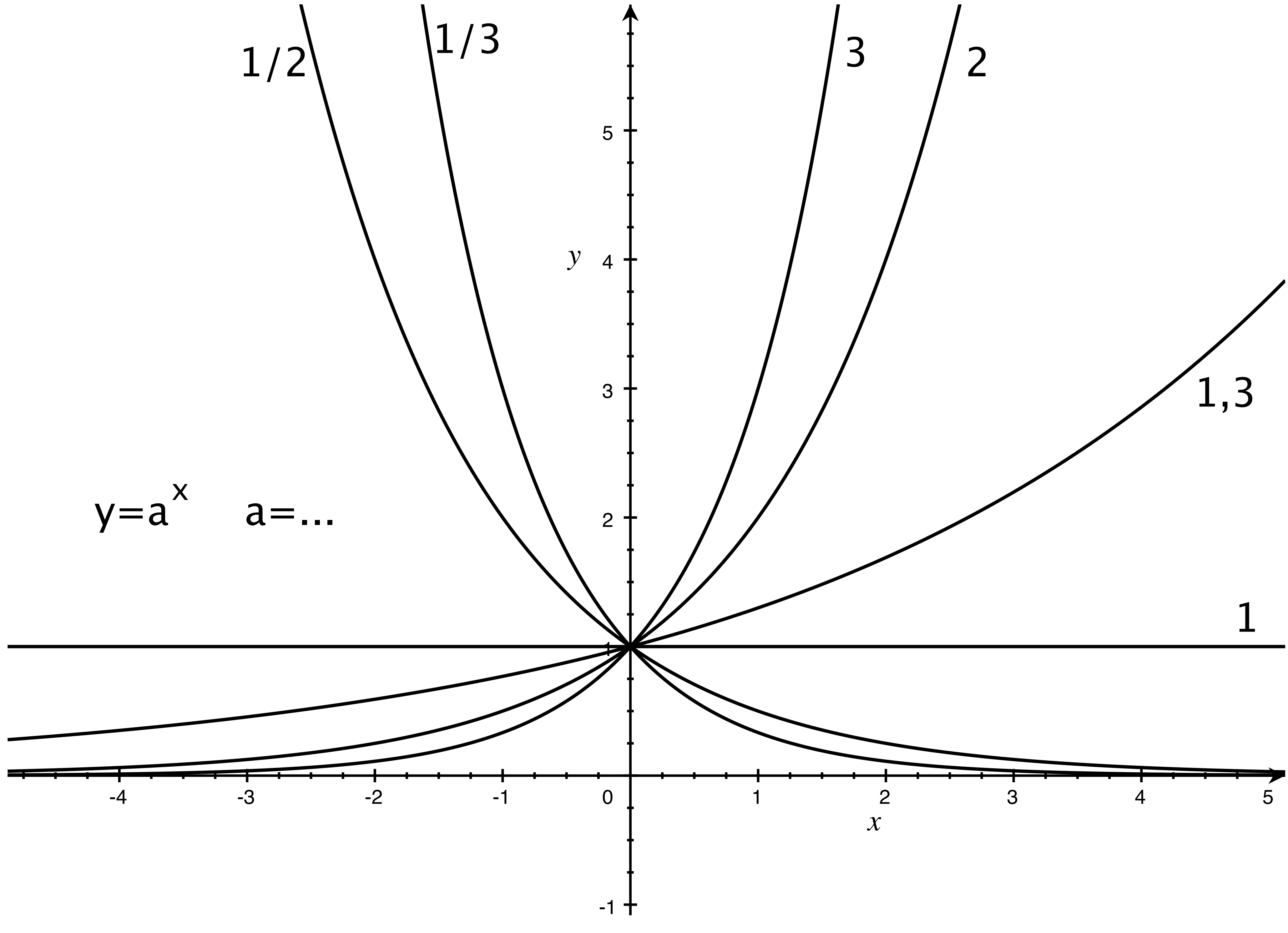

y=2^x
y
x
5
4
3
2
1
0
-1
-4
-3
-2
-1
1
2
3
4
5


y=3^x
y
x
5
4
3
2
1
0
-1
-4
-3
-2
-1
1
2
3
4
5

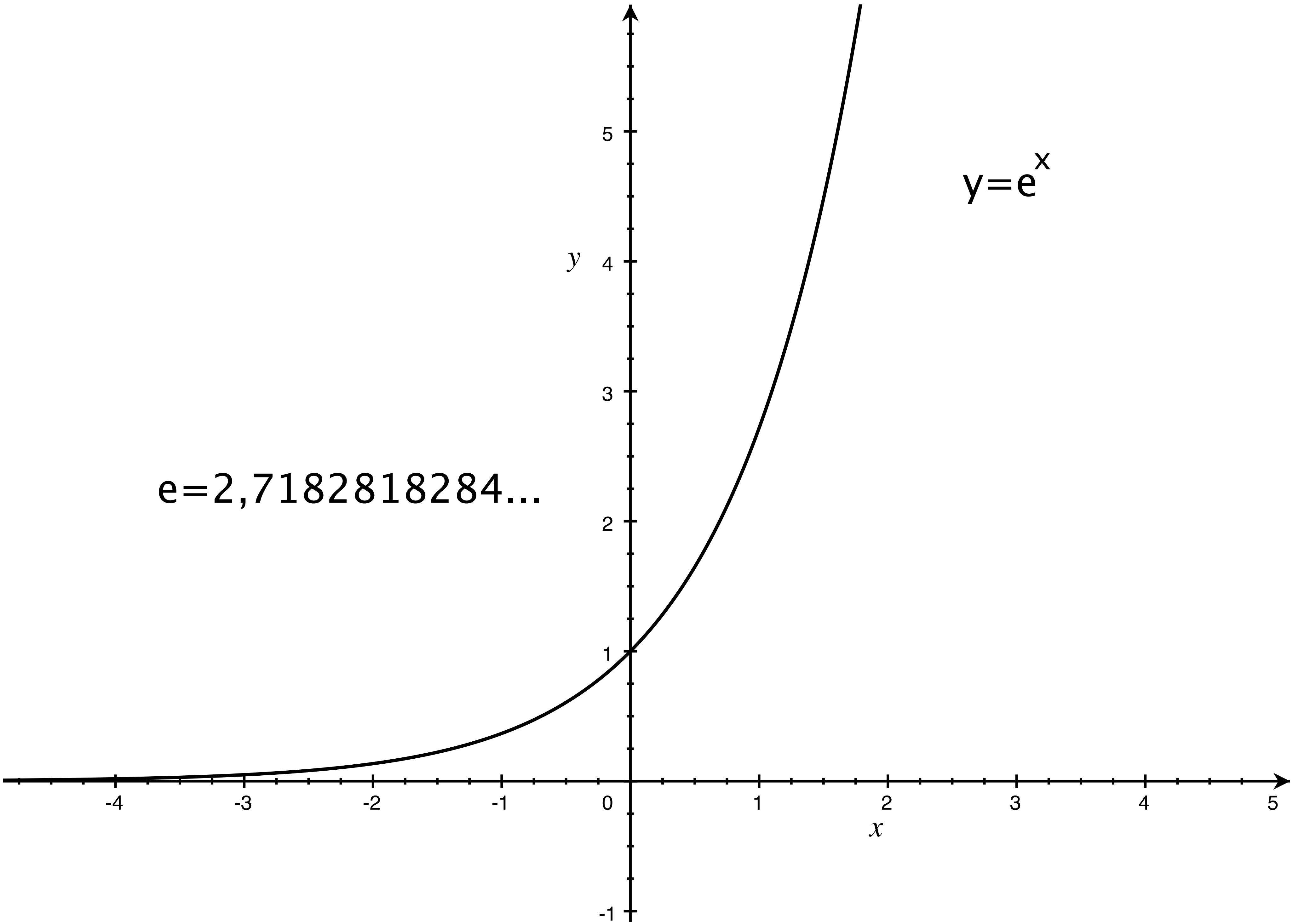


y=(1/2)^x
y
x
5
4
3
2
1
-1
-4
-3
-2
-1
0
1
2
3
4
5


y=(1/3)^x
y
x
5
4
3
2
1
0
-1
-4
-3
-2
-1
1
2
3
4
5



1/2
1/3
3
2
1,3
1
y=a^x   a=...
y
x
5
4
3
2
1
0
-1
-4
-3
-2
-1
1
2
3
4
5



y=e^x
e=2,7182818284...
y
x
5
4
3
2
1
-1
-4
-3
-2
-1
0
1
2
3
4
5

Proprietà Per ogni $a, b, x, y \in \mathbb{R}^+$, $a \neq 1$, $b \neq 1$, risulta:

1) $a^{\log_a x} = x$ (per definizione);

2) $\log_a xy = \log_a x + \log_a y$

3) $\log_a (1/x) = -\log_a x$

4) $\log_a (x/y) = \log_a x - \log_a y$

5) $\log_a x^\alpha = \alpha \log_a x \quad \forall \alpha \in \mathbb{R}$

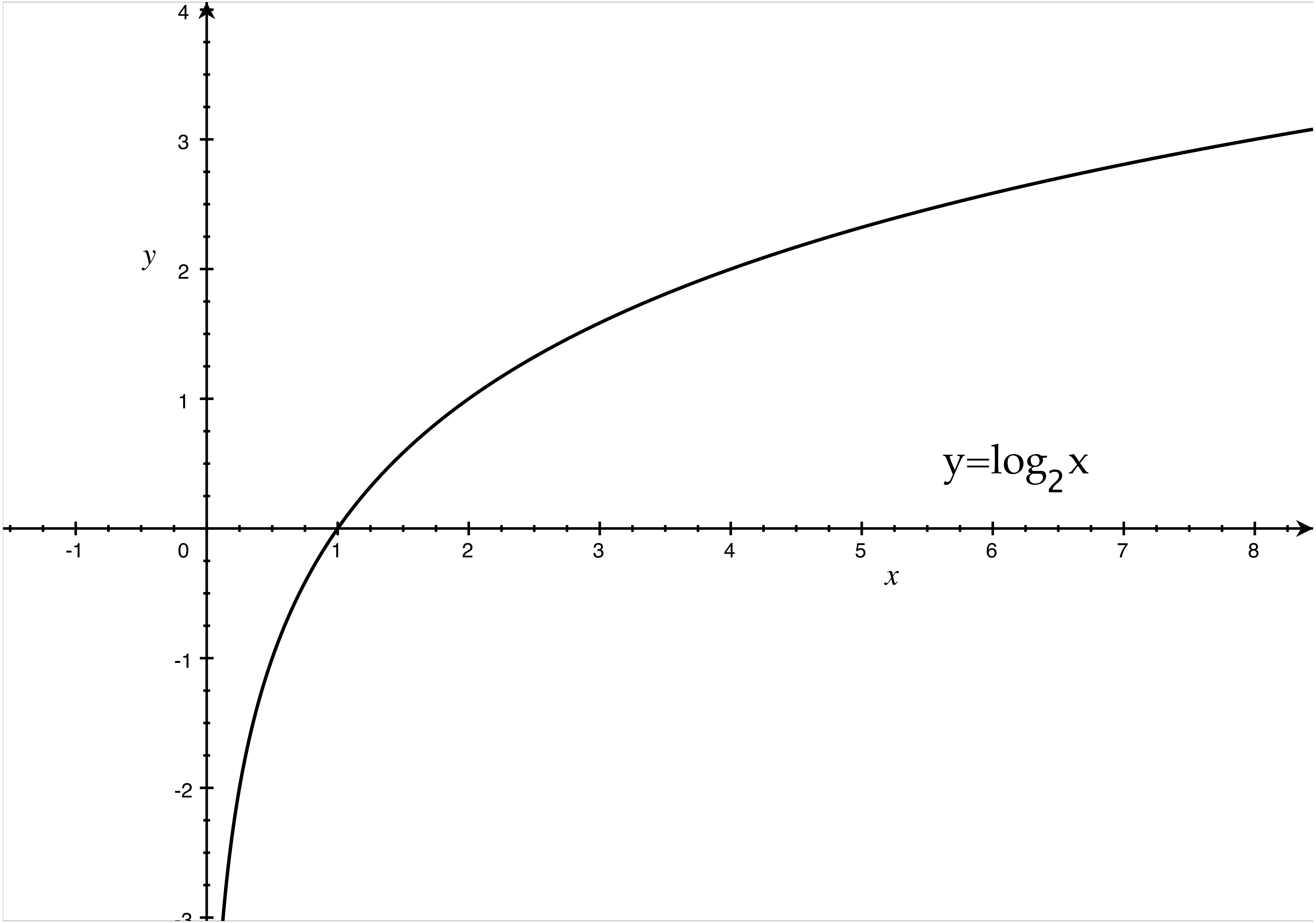
6) $\log_a x = 1/\log_x a = -\log_{\frac{1}{a}} x$

7) *(Cambiamento di base)* $\log_a x = \log_b x / \log_b a$

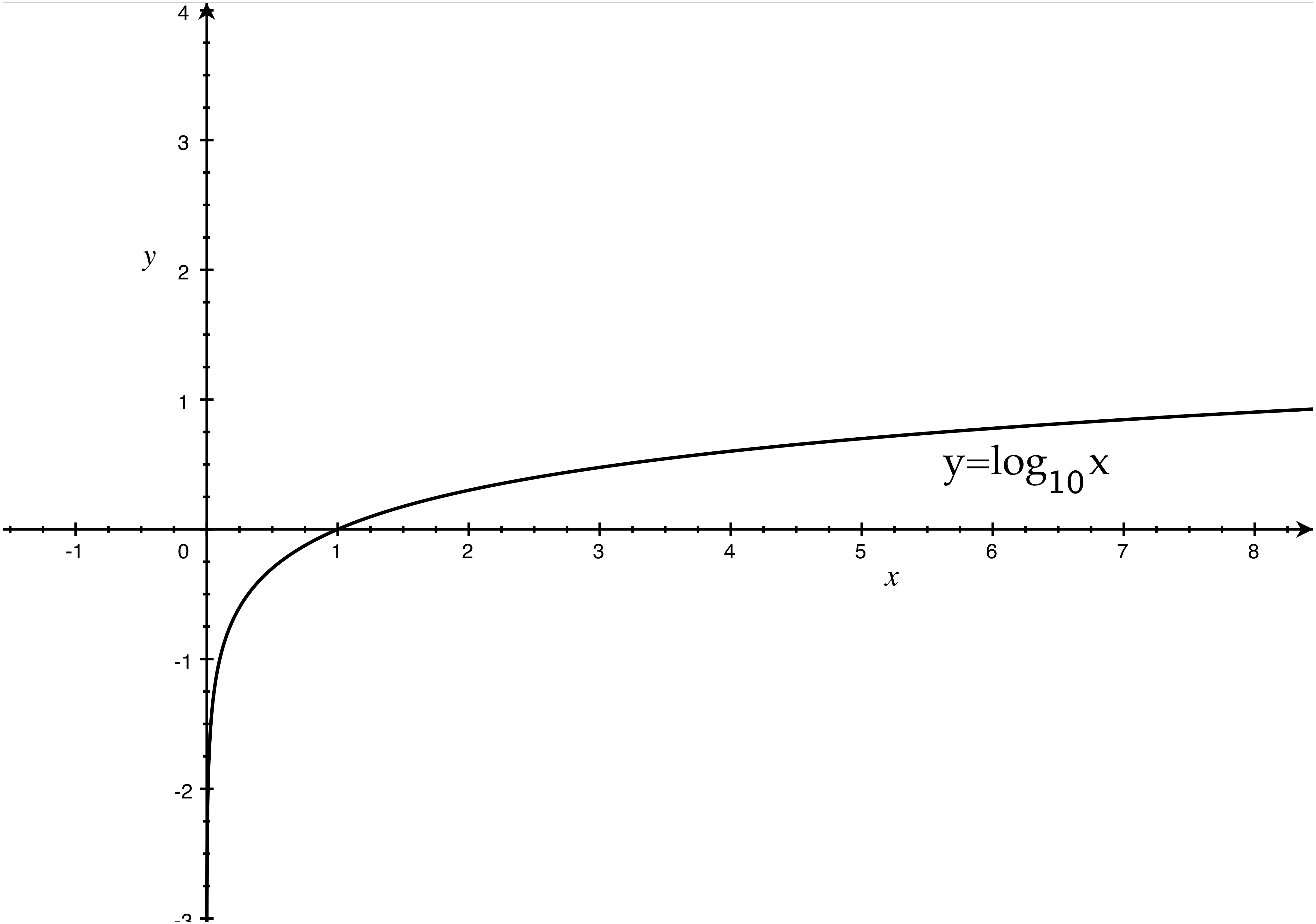
8) $x > y > 0 \Rightarrow \begin{cases} \log_a x > \log_a y & \text{se } a > 1 \\ \log_a x < \log_a y & \text{se } 0 < a < 1 \end{cases}$

9) $\forall\, a \in \mathbb{R}^+,\ a \neq 1 \Rightarrow \begin{cases} \log_a 1 = 0 \\ \log_a a = 1 \\ \log_a (1/a) = -1; \end{cases}$

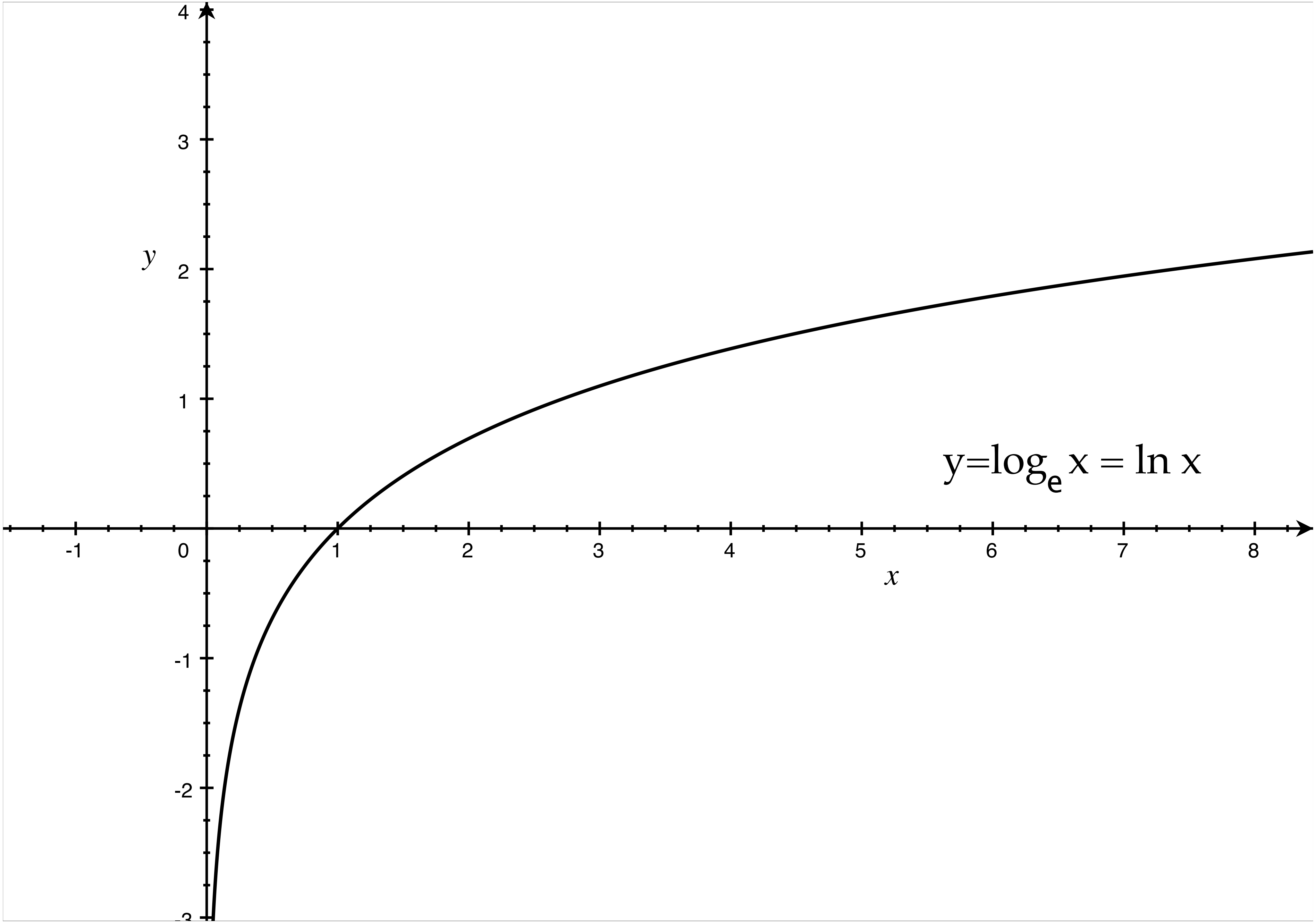
10) $\begin{cases} \forall\, x \neq 0 \Rightarrow \log_a x^2 = 2 \log_a |x| \\ \forall\, x,\ y : xy > 0 \Rightarrow \log_a (xy) = \log_a |x| + \log_a |y|. \end{cases}$



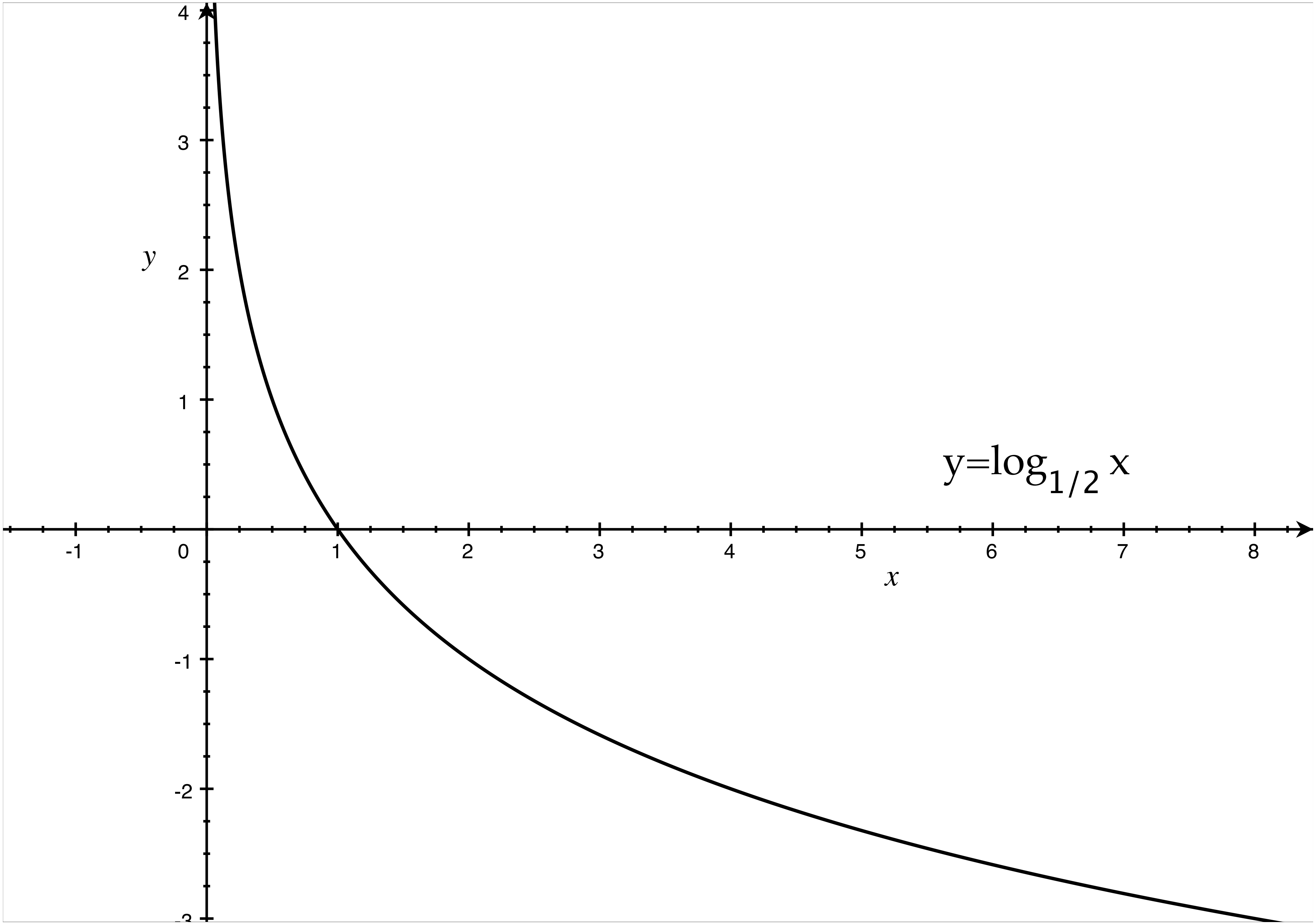
y
x
4
3
2
1
-1
-2
-3
-1
0
1
2
3
4
5
6
7
8
y=log2x

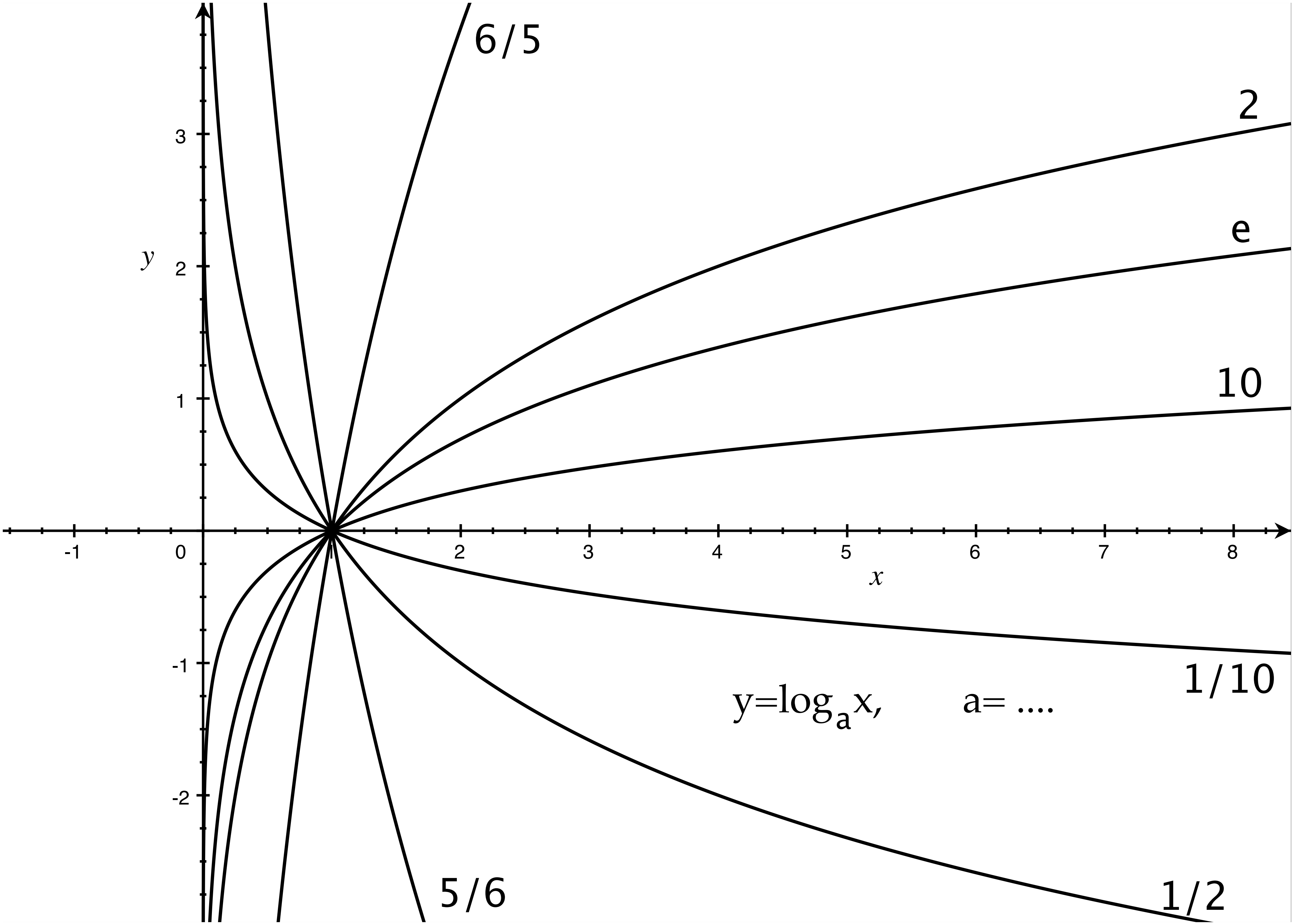


y
x
4
3
2
1
-1
-2
-3
-1
0
1
2
3
4
5
6
7
8
y=log10x



y=log_e x = ln x
x
y
-1
0
1
2
3
4
5
6
7
8
-3
-2
-1
1
2
3
4


y=log1/2 x
y
x
4
3
2
1
-1
-2
-3
-1
0
1
2
3
4
5
6
7
8


6/5
2
e
10
1/10
1/2
5/6
y=log$_a$x,   a= ....
y
x
3
2
1
-1
-2
0
-1
2
3
4
5
6
7
8