



WORKBOOK

<http://agb.gymnaslo.cz>



Subject: Mathematics

Student:

School year:/.....

Exponential function

Consider a function of the form $y = a^x$, where $a > 0$. Such a function is called an **exponential** function. We can take three different cases, where $a = 1$, $0 < a < 1$ and $a > 1$.

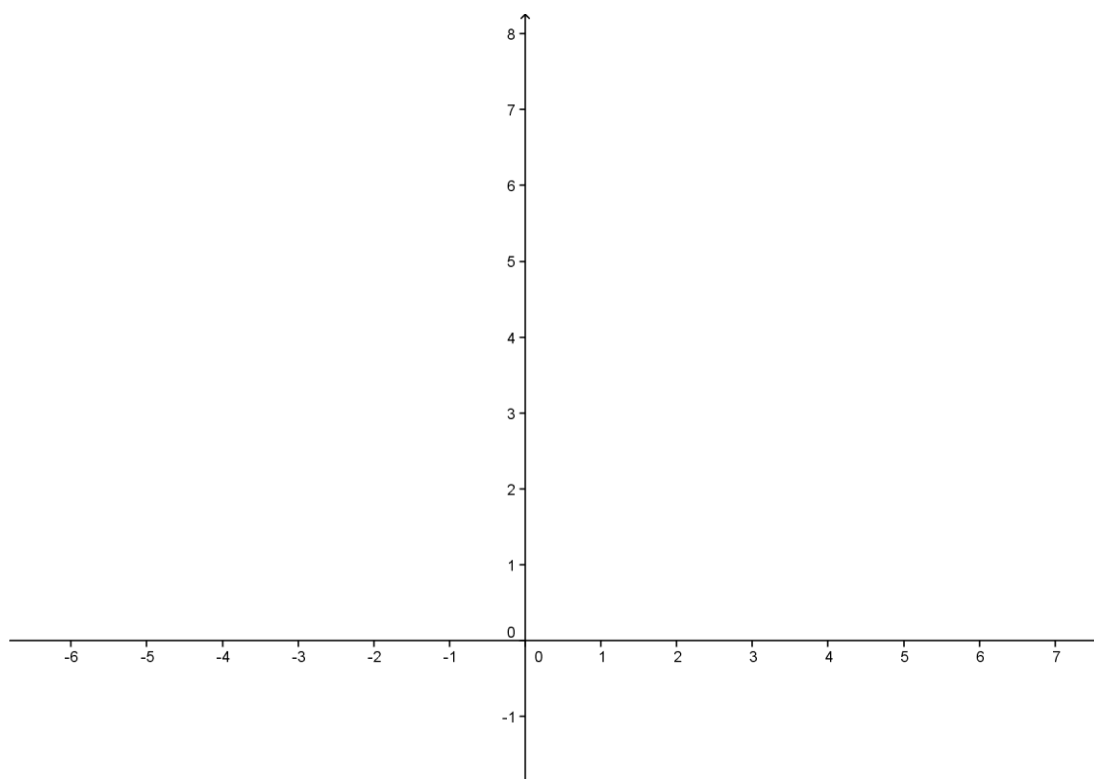
If $a = 1$ then $f(x) = 1^x = 1$.

So this just gives us the constant function $f(x) = 1$.



Př. Graph the function $y = 2^x$

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

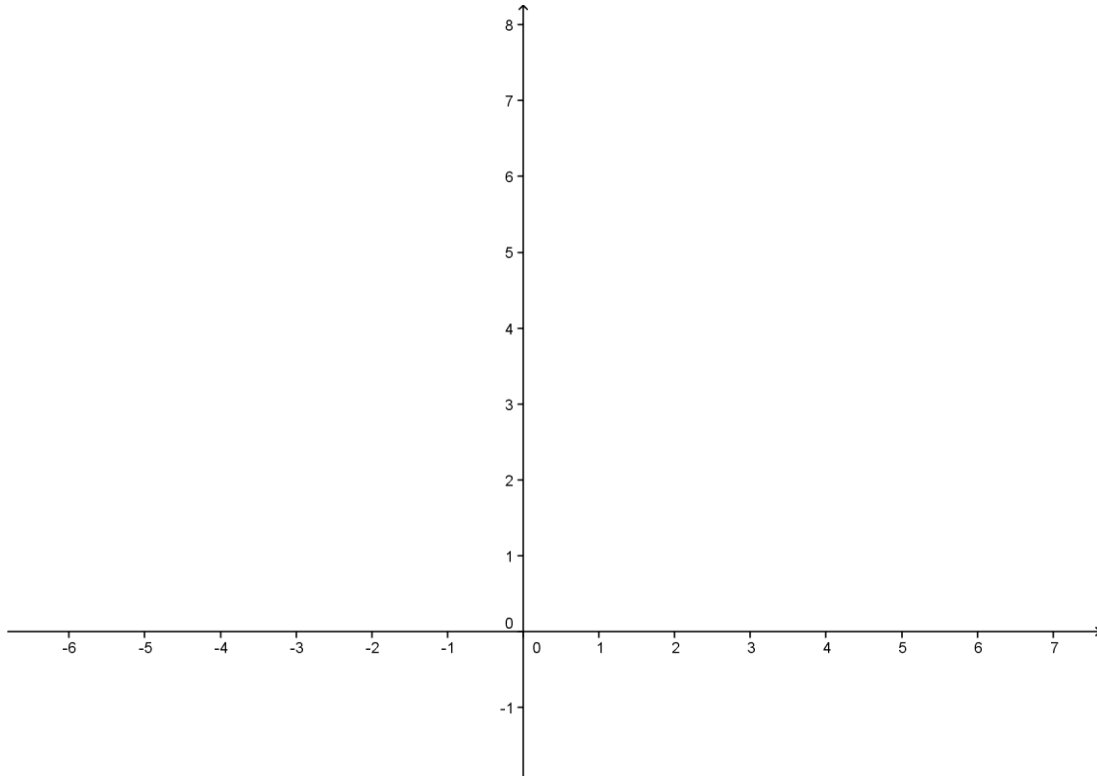


This example demonstrates the general shape for graphs of functions of the form $f(x) = a^x$ when $a > 1$.

$0 < a < 1$: To examine this case, take another numerical example. Suppose that $a = \frac{1}{2}$.

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

x	-3	-2	-1,5	-1	-0,5	0	0,5	1	1,5	2	3
$\left(\frac{1}{2}\right)^x$	8	4				1					



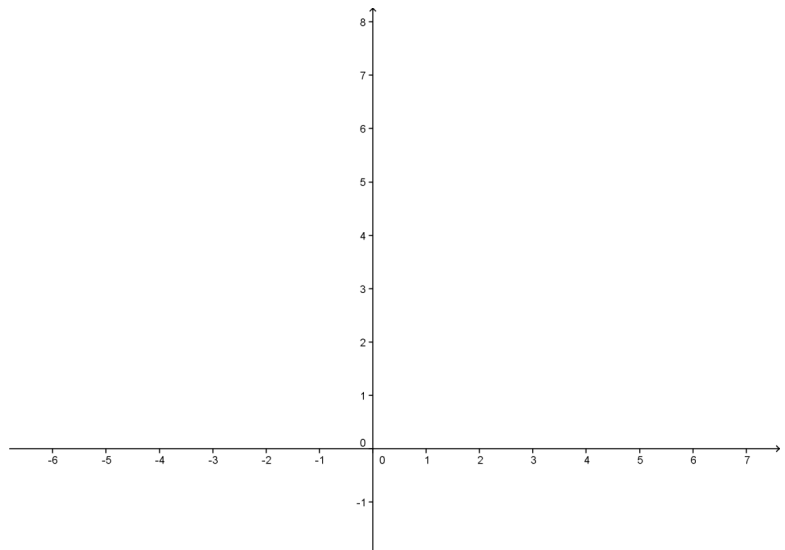
Exercises:

1. Sketch the graph of the function $f(x) = a^x$ for the following values of a , on the same axes.

- a) $a = 3$ b) $a = 6$ c) $a = 1$ d) $a = \frac{1}{2}$ e) $a = \frac{1}{6}$

2. Prove that the number $\left(\frac{7}{3}\right)^{-0,5}$ is smaller than 1.





3. .Decide if it is true:

a) $(0,4)^{1,6} < (0,4)^{1,8}$

b) $\left(\frac{6}{7}\right)^{2,5} < \left(\frac{6}{7}\right)^{2,4}$

c) $\left(\frac{4}{3}\right)^{1,4} < \left(\frac{4}{3}\right)^{1,3}$

4. Write the relation between **p,r** :

$$\left(\frac{3}{7}\right)^p < \left(\frac{3}{7}\right)^r$$

$$\left(\frac{8}{5}\right)^p < \left(\frac{8}{5}\right)^r$$