

Exercise 11

Guess the value of the limit

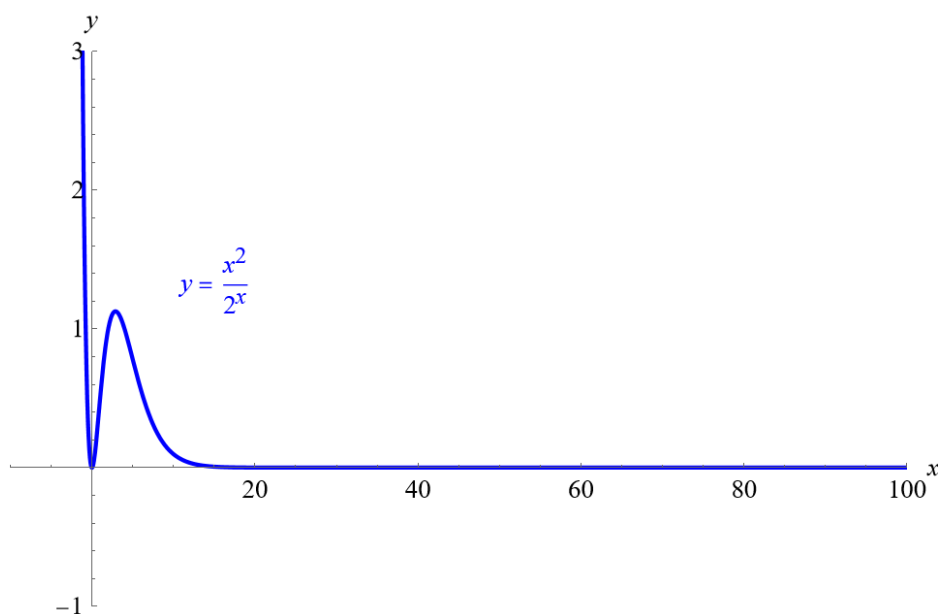
$$\lim_{x \rightarrow \infty} \frac{x^2}{2^x}$$

by evaluating the function $f(x) = x^2/2^x$ for $x = 0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 20, 50,$ and 100 . Then use a graph of f to support your guess.

Solution

Evaluate the function at the given values of x .

x	$f(x)$
0	0
1	0.5
2	1
3	1.125
4	1
5	0.78125
6	0.5625
7	0.382813
8	0.25
9	0.158203
10	0.0976563
20	0.00038147
50	2.22045×10^{-12}
100	7.88861×10^{-27}



$$\lim_{x \rightarrow \infty} \frac{x^2}{2^x} = 0$$