

## Equação exponencial

$$6^x = x^{18}$$

Aplicando a raiz 18ª:  $\sqrt[18]{6^x} = \sqrt[18]{x^{18}} = x$

Ou seja:  $6^{x/18} = x$

Aplicando a raiz  $x$ ª:  $\sqrt[x]{6^{x/18}} = \sqrt[x]{x}$

Ou seja:  $6^{1/18} = x^{1/x}$

Como  $6 = \sqrt{36}$ , temos que:  $x^{1/x} = \sqrt{36}^{1/18} = (36^{1/2})^{1/18}$

Ou seja:  $x^{1/x} = 36^{1/36} \rightarrow x = 36$  é uma resposta

Numericamente:

$$x = 6^{x/18}$$

$$x_{n+1} = 6^{x_n/18}$$

Começando com  $x_0 = 35$   
A sequência  $\rightarrow$  **1,117682**  
(6 decimais)

$$E \ x_{n+1} = \frac{18 \ln(x_n)}{\ln(6)}$$

Começando com  $x_0 = 10$   
A sequência  $\rightarrow$  **36**

x	6^(x/18)		x	18ln(x)/ln(6)
35	32,589063		10	23,1317498
32,58906	25,635723		23,13175	31,5565293
25,63572	12,83064		31,55653	34,6765570
12,83064	3,5865475		34,67656	35,6237267
3,586548	1,4290542		35,62373	35,8944463
1,429054	1,1528662		35,89445	35,9705014
1,152866	1,1216029		35,9705	35,9917649
1,121603	1,1181179		35,99176	35,9977017
1,118118	1,1177301		35,9977	35,9993586
1,11773	1,1176869		35,99936	35,9998210
1,117687	1,1176821		35,99982	35,9999501
1,117682	1,1176816		35,99995	35,9999861
1,117682	1,1176815		35,99999	35,9999961
1,117682	1,1176815		36	35,9999989
1,117682	1,1176815		36	35,9999997
1,117682	1,1176815		36	35,9999999
1,117682	1,1176815		36	36,0000000
1,117682	1,1176815		36	36,0000000