Precalculus
Basic exponent equation of type $e^{px+q} = A$

Todor Milev

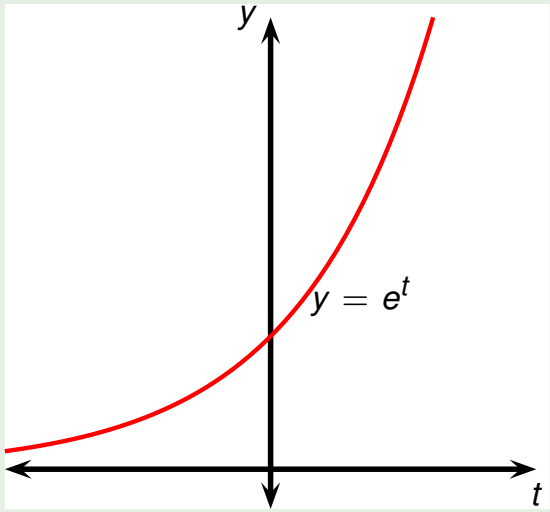
2019

Example

Solve the equation.

$$\begin{aligned} e^{5-3x} &= 10 \\ \ln(e^{5-3x}) &= \ln 10 \\ 5-3x &= \ln 10 \\ 3x &= 5-\ln 10 \\ x &= \frac{5-\ln 10}{3} \\ \text{Calculator:}\quad x &\approx 0.8991. \end{aligned}$$

Example



$$e^{2x+3} = -1$$

no real solution

- Exponents (of real numbers) are positive, never negative.
- $\Rightarrow$ “No real solution” is an appropriate answer.
- Exponents of complex numbers can be negative (google Euler’s f-la).
- “no solution” is not appropriate.

Example

$$e^{3x-1} = 0$$

no solution

- Exponents are never 0 (even for complex numbers).
- “no solution” is the appropriate answer.