

Precalculus

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

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Example

Solve the equation.

$$\begin{aligned}
 2^{1-5x} &= 12 && | \text{ apply } \log_2 \\
 \log_2(2^{1-5x}) &= \log_2 12 \\
 1 - 5x &= \log_2 12 = \log_2(4 \cdot 3) \\
 1 - 5x &= \log_2 4 + \log_2 3 \\
 1 - 5x &= 2 + \log_2 3 \\
 5x &= 1 - (2 + \log_2 3) \\
 &= -1 - \log_2 3 \\
 x &= \frac{-1 - \log_2 3}{5} \\
 \text{Calculator: } x &\approx -0.516993.
 \end{aligned}$$