



Solving Exponential Equations

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Exponential equations can be solved using log laws and index laws.
Use these laws to isolate unknown variables equations.

EXAMPLE: Solve for x if $4 \times 3^x = 100$

STEP ONE: Simplify equation

$$4 \times 3^x = 100$$
$$3^x = 25$$

STEP TWO: Use log laws to isolate x .

Recall that $3^x = 25$ is equivalent to $\log_3 25 = x$

STEP THREE: Evaluate.

To enter into a calculator, enter in the
log(power) divided by log(base)

$$x = \log_3 25$$
$$x = \log(25) / \log(3)$$
$$x \cong 2.93$$

Instructions: Solve the exponential equations below.

1	$3^x = 50$	3	$4^x = 30$
2	$6^x = 42$	4	$3^x - 2 = 20$



5	$4^{x+1} = 25$	9	$4^{x-5} = 16^{x-3}$
6	$5^{x+3} = 250$	10	$3^{x+9} = 9^{2x}$
7	$3^{4x-3} = 3^{5x-9}$	11	$27^{3x+5} = 9^{5x-3}$
8	$8^{4x+1} = 72$	12	$1000^{4x-8} = 10,000^{x+8}$



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$$25^{x-9} = 125^{x+10}$$

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$$3^{x+1} = 4^{2x-1}$$

14

$$49^{3x-9} = 343^{4x+10}$$

18

$$36^{x+2} = 8^{4-x}$$

15

$$512^{4x-8} = 64^{9-x}$$

19

$$9^{2x+1} = 108$$

16

$$36^{9x+4} = 216^{7x+4}$$

20

$$81^{3x+1} = 125^{4x+3}$$