

How to solve $3^x = 57$?

Method 1

Method 2

Change of base formula:

$$\log_a b = \frac{\log b}{\log a}$$

Solve for x and round to the nearest hundredth.

1. $4^x = 8$

$$x = \log_4 8 \\ = 1.5$$

2. $\left(\frac{1}{5}\right)^x = 6$

$$x = \log_{\frac{1}{5}} 6 \\ = -1.11$$

3. $9^{-x} \cdot 9^5 = 29$

$$9^{5-x} = 29 \\ 5-x = \log_9 29 \\ x = 3.47$$

4. $5^{x-3} = 42$

$$x-3 = \log_5 42 \\ x = 5.32$$

5. $\left(\frac{3}{5}\right)^{(2-x)} = 17$

$$\log_{\frac{3}{5}} 17 = 2-x \\ x = 7.55$$

6. $2 + 3 \cdot 4^x = 5$

$$3 \cdot 4^x = 3 \\ 4^x = 1 \\ x = 0$$

7. $16^{3x^2} = 7$

$$\log_{16} 7 = 3x^2 \\ x = \pm 0.48$$

8. $6^{\sqrt[3]{x+1}} = 10$

$$\log_b 10 = \sqrt[3]{x+1} \\ x = 1.12$$

9. $6 + 8 \cdot 7^{x+1} = 30$

$$8 \cdot 7^{x+1} = 24 \\ 7^{x+1} = 3 \\ \log_7 3 = x+1 \\ x = -0.44$$