



Solve exponential equations using logarithms

1

What does the logarithm equation mean?

$$\log_3 81 = ?$$

A

What number would you raise 3 by to result in 81?

B

What number would you raise 81 by to result in 3?

2

Convert the given exponent to the equivalent in logarithm form

$$6^2 = 36$$

A

$$\log_{36} 2 = 6$$

B

$$\log_6 36 = 2$$

C

$$\log_2 6 = 36$$

D

$$\log_{36} 6 = 2$$

3

Convert the given logarithm to the equivalent in exponent form

$$\log_8 64 = 2$$

A

$$2^8 = 64$$

B

$$64^8 = 2$$

C

$$8^2 = 64$$

D

$$2^{64} = 8$$

4

Solve the following logarithm

$$\log_5 25 = x$$

A

$$x = 1$$

B

$$x = 0$$

C

$$x = 2$$

D

$$x = 3$$

E

$$x = 4$$

5

Use a logarithm to solve for the missing exponent

$$6^x = 216$$

A

$$x = 4$$

B

$$x = 1$$

C

$$x = 2$$

D

$$x = 5$$

E

$$x = 3$$

6

Convert the given logarithm to the equivalent in exponent form

$$\log_9 243 = 2.5$$

A

$$2.5^{243} = 9$$

B

$$2.5^9 = 243$$

C

$$243^9 = 2.5$$

D

$$9^{2.5} = 243$$

7

Convert the given exponent to the equivalent in logarithm form

$$2^{4.1} = 17$$

A

$$\log_{17} 4.1 = 2$$

B

$$\log_{4.1} 17 = 2$$

C

$$\log_2 17 = 4.1$$

D

$$\log_{4.1} 2 = 17$$

8

Use the power rule to simplify this equation

$$7^{(8n-4)} = 6^{(-4n+9)}$$

A

$$(-4n + 8) \ln 7 = (9n - 4) \ln 6$$

B

$$(8n + 4) \ln 7 = (-4n - 9) \ln 6$$

C

$$(8n - 4) \ln 7 = (-4n + 9) \ln 6$$



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9

Use the power rule to simplify this and solve for 'y'

$$4^{(y+2)} = 8^{(y)}$$

A $y = \frac{-2 \ln 4}{\ln 4 - \ln 8}$

B $y = \frac{\ln 8 - \ln 4}{2 \ln 4 - 2 \ln 8}$

C $y = \frac{-2 \ln 8}{\ln 8 - \ln 4}$

10

Use a logarithm to solve for the missing exponent

$$6^x = 366$$

A $x = 3.29$

B $x = 5.29$

C $x = 4.29$

D $x = 1.29$

E $x = 2.29$

11

Use the power rule to simplify this and solve for 'x'

$$6^{(x+3)} = 5^{(x+1)}$$

A $x = \frac{1 \ln 6 - 3 \ln 5}{\ln 5 - \ln 6}$

B $x = \frac{\ln 5 - \ln 6}{3 \ln 6 - \ln 5}$

C $x = \frac{\ln 5 - 3 \ln 6}{\ln 6 - 1 \ln 5}$

12

Use a logarithm to solve for the missing exponent

$$2^x = 11.31$$

A $x = 2.5$

B $x = 5.5$

C $x = 3.5$

D $x = 4.5$

E $x = 1.5$

13

Use the power rule to simplify this and solve for 'y'

$$4^{(-1y-7)} = 3^{(-5y)}$$

A $y = \frac{-5 \ln 3 + \ln 4}{-7 \ln 4 - 2 \ln 3}$

B $y = \frac{7 \ln 4}{-1 \ln 4 + 5 \ln 3}$

C $y = \frac{7 \ln 3}{-1 \ln 3 + 5 \ln 4}$

14

What is the value of the time given this model of a growth in credit card debt with quarterly interest?

$$614 = 500 \cdot (1 + 0.03)^{\left(\frac{t}{3}\right)}$$

A $t = 24$ months

B $t = 22$ months

C $t = 21$ months

D $t = 26$ months