



## Solve logarithmic equations

**1**

What does the logarithm equation mean?

$$\log_6 36 = ?$$

A

What number would you raise 36 by to result in 6?

B

What number would you raise 6 by to result in 36?

**2**

Convert the given logarithm to the equivalent in exponent form

$$\log_{10} 10,000 = 4$$

A

$$10^4 = 10,000$$

B

$$4^{10,000} = 10$$

C

$$4^{10} = 10,000$$

D

$$10,000^4 = 10$$

E

$$10,000^{10} = 4$$

**3**

Use a logarithm to solve for the missing exponent

$$10^x = 100$$

A

$$x = 1$$

B

$$x = 4$$

C

$$x = 3$$

D

$$x = 2$$

E

$$x = 0$$

**4**

Use a logarithm to solve for the missing exponent

$$4^x = 285$$

A

$$x = 4.08$$

B

$$x = 2.08$$

C

$$x = 5.08$$

D

$$x = 6.08$$

E

$$x = 3.08$$

**5**

Use a logarithm to solve for the missing exponent

$$4^x = 16$$

A

$$x = 2$$

B

$$x = 3$$

C

$$x = 0$$

D

$$x = 1$$

E

$$x = 4$$

**6**

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

$$5^{(x+4)} = 2^{(x)}$$

A

$$x = \frac{-4 \ln 5}{\ln 5 - \ln 2}$$

B

$$x = \frac{-4 \ln 2}{\ln 2 - \ln 5}$$

C

$$x = \frac{\ln 2 - \ln 5}{4 \ln 5 - 2 \ln 2}$$

**7**

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

$$9^{(-4w-4)} = 5^{(-1w)}$$

A

$$w = \frac{4 \ln 9}{-4 \ln 9 + \ln 5}$$

B

$$w = \frac{-1 \ln 5 + 4 \ln 9}{-4 \ln 9 - 2 \ln 5}$$

C

$$w = \frac{4 \ln 5}{-4 \ln 5 + \ln 9}$$

**8**

Use the power rule to simplify this equation

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

A

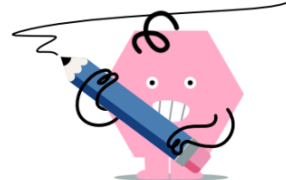
$$(8n - 4) \ln 7 = (-4n + 9) \ln 6$$

B

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

C

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



## Solve logarithmic equations

**9**

Use the quotient rule to simplify this to a quadratic of variable 'x'

$$\log_7(x+9) - \log_7(x+9) = \log_7(1x)$$

A  $x^2 - 7x + 10 = 0$

B  $-1x^2 - 9x + 6 = 0$

C  $-1x^2 - 8x + 9 = 0$

**10**

Simplify and solve for z

$$\log_3\left(\frac{z+5}{z-3}\right) = 2$$

A  $z = 4$

B  $z = 6$

**11**

Simplify and solve for t

$$\log_2\left(\frac{7t+18}{2t}\right) = 3$$

A  $t = 3$

B  $t = 1$

C  $t = 2$

D  $t = 4$

**12**

Simplify and solve for q

$$\log_5(q+4) = 2$$

A  $q = 21$

B  $q = 29$

**13**

Use the product rule to simplify this to a quadratic and solve for 'y'

$$\log_2(y+5) + \log_2(y+7) = \log_2(3)$$

A  $y = -11$

B  $y = -4$

C  $y = -2$

**14**

Solve the following logarithm

$$\log_{10} 10,000 = x$$

A  $x = 4$

B  $x = 3$

C  $x = 6$

D  $x = 2$

E  $x = 5$

**15**

Solve the following logarithm

$$\log_{\frac{1}{10}} \frac{1}{10,000} = x$$

A  $x = 4$

B  $x = 8$

C  $x = -4$

D  $x = 7$

E  $x = -1$

F  $x = 13$

**16**

Solve the following logarithm

$$\log_e 134.29 = x$$

A  $x = 5.9$

B  $x = 6.9$

C  $x = 4.9$

D  $x = 3.9$

E  $x = 2.9$