



Logarithmic Concepts

- 1** Convert the given logarithm to its equivalent based on the power property

$$\log_5 64$$

- | | |
|----------------|----------------|
| A $8 \log_5 2$ | B $2 \log_5 8$ |
| C $5 \log_8 2$ | D $5 \log_2 8$ |

- 2** Convert the given logarithm to its equivalent based on the power property

$$\log_6 12^2$$

- | | |
|-----------------|-------------------|
| A $6 \log_2 12$ | B $6 \log_{12} 2$ |
| C $12 \log_6 2$ | D $2 \log_6 12$ |

- 3** Convert the given logarithm to its equivalent based on the power property

$$\log_w m^t$$

- | | |
|----------------|----------------|
| A $w \log_t m$ | B $t \log_w m$ |
| C $m \log_w t$ | |

- 4** Use the power rule to simplify this and solve for 'm'

$$6^{(5m-4)} = 7^{(9m)}$$

- | | |
|---|--|
| A $m = \frac{4 \ln 6}{5 \ln 6 - 9 \ln 7}$ | B $m = \frac{9 \ln 7 - 5 \ln 6}{-4 \ln 6 - 2 \ln 7}$ |
| C $m = \frac{4 \ln 7}{5 \ln 7 - 9 \ln 6}$ | |

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

$$10^{(-8x-9)} = 8^{(-3x-5)}$$

- | | |
|---|---|
| A $x = \frac{-3 \ln 8 + 8 \ln 10}{-9 \ln 10 + 5 \ln 8}$ | B $x = \frac{-5 \ln 8 + 9 \ln 10}{-8 \ln 10 + 3 \ln 8}$ |
| C $x = \frac{-5 \ln 10 + 9 \ln 8}{-8 \ln 8 + 3 \ln 10}$ | |

- 6** Use the product rule to simplify this to a quadratic and solve for 'p'

$$\log_8(p-9) + \log_8(p-6) = \log_8(4)$$

- | | |
|------------|------------|
| A $p = 3$ | B $p = 16$ |
| C $p = 10$ | |

- 7** Use the product rule to simplify this to a quadratic and solve for 'p'

$$\log_5(6p-6) + \log_5(p-1) = \log_5(6)$$

- | | |
|------------|-----------|
| A $p = 2$ | B $p = 6$ |
| C $p = -2$ | |

- 8** Convert the given logarithm to its equivalent based on the product property

$$\log_n p + \log_n x$$

- | | |
|------------------------|-----------------------|
| A $\log_n \frac{p}{x}$ | B $\log_n(p \cdot x)$ |
| C $\log_x(n \cdot p)$ | |



Logarithmic Concepts

- 9** Convert the given logarithm to its equivalent based on the product property

$$\log_x(w \cdot t)$$

A $\log_x w + \log_x t$

B $\log_t x + \log_x w$

C $w \cdot \log_x t$

- 10** Convert the given logarithm to its equivalent based on the quotient property

$$\log_p \frac{z}{m}$$

A $\log_p m - \log_p z$

B $\log_p z - \log_p m$

- 11** Use the quotient rule to simplify this to a quadratic and solve for 'q'
 $\log_3(q + 10) - \log_3(-1q + 8) = \log_3(1q)$

A $q = -5$
 $q = -3$

B $q = 13$
 $q = 1$

C $q = 5$
 $q = 2$

- 12** Convert the given logarithm to its equivalent based on the quotient property

$$\log_2 1.13$$

A $\log_3 9 - \log_3 8$

B $\log_9 8 - \log_9 2$

C $\log_2 9 - \log_2 8$

D $\log_9 2 - \log_9 8$

E $\log_2 8 - \log_2 9$

- 13** Convert the given logarithm to its equivalent based on the quotient property

$$\log_q z - \log_q t$$

A $\log_q \frac{z}{t}$

B $\log_q \frac{t}{z}$

C $\log_t \frac{q}{z}$

- 14** Convert the given logarithm to its equivalent based on the quotient property

$$\log_5 8 - \log_5 10$$

A $\log_5 1.8$

B $\log_5 0.8$

C $\log_7 0.8$

D $\log_6 0.8$

E $\log_5 -1.2$

- 15** Use the quotient rule to simplify this to a quadratic and solve for 'm'

$$\log_{10}(m + 5) - \log_{10}(m + 5) = \log_{10}(1m)$$

A $m = -7$

B $m = 5$

C $m = 1$



Logarithmic Concepts

- 16** Convert the given logarithm to its equivalent based on the quotient property

$$\log_5 8 - \log_5 3$$

A $\log_5 \frac{8}{3}$

B $\log_3 \frac{5}{8}$

C $\log_5 \frac{3}{8}$

- 17** Convert the given logarithm to its equivalent based on the power property

$$2 \log_9 10$$

A $\log_9 10^2$

B $\log_{10} 9^2$

C $\log_9 2^{10}$

- 18** Convert the given exponent to the equivalent in logarithm form

$$(6)^{-2} = \frac{1}{36}$$

A $\log_{\frac{1}{36}} -2 = 6$

B $\log_{-2} \frac{1}{36} = 6$

C $\log_6 \frac{1}{36} = -2$

- 19** Convert the given exponent to the equivalent in logarithm form

$$3^3 = 27$$

A $\log_{27} 3 = 3$

B $\log_3 27 = 3$

C $\log_3 3 = 27$

- 20** Convert the given exponent to the equivalent in logarithm form

$$6^{3.34} = 400$$

A $\log_{3.34} 400 = 6$

B $\log_{400} 3.34 = 6$

C $\log_6 400 = 3.34$

D $\log_{400} 6 = 3.34$

- 21** Convert the given exponent to the equivalent in logarithm form

$$\left(\frac{1}{4}\right)^2 = \frac{1}{16}$$

A $\log_2 \frac{1}{4} = \frac{1}{16}$

B $\log_{\frac{1}{4}} \frac{1}{16} = 2$

C $\log_2 \frac{1}{16} = \frac{1}{4}$

- 22** Convert the given logarithm to the equivalent in exponent form

$$\log_4 379 = 4.28$$

A $379^4 = 4.28$

B $379^{4.28} = 4$

C $4^{4.28} = 379$

D $4.28^{379} = 4$

- 23** Convert the given exponent to the equivalent in logarithm form

$$e^{4.92} = x$$

A $\log_e x = 4.92$

B $\log_x 4.92 = e$

C $\log_{4.92} x = e$

D $\log_x e = 4.92$



Logarithmic Concepts

- 24** Convert the given logarithm to the equivalent in exponent form

$$\log_e 4.64 = x$$

- | | |
|---|----------------|
| A | $e^x = 4.64$ |
| B | $x^{4.64} = e$ |
| C | $4.64^x = e$ |
| D | $4.64^e = x$ |

- 25** Convert the given logarithm to the equivalent in exponent form

$$\log_4 338 = 4.2$$

- | | |
|---|-----------------|
| A | $338^4 = 4.2$ |
| B | $338^{4.2} = 4$ |
| C | $4.2^4 = 338$ |
| D | $4^{4.2} = 338$ |

- 26** Convert the given logarithm to the equivalent in exponent form

$$\log_{10} \frac{1}{10,000} = -4$$

- | | |
|---|------------------------------|
| A | $\frac{1}{10,000}^{-4} = 10$ |
| B | $-4^{10} = \frac{1}{10,000}$ |
| C | $-4^{\frac{1}{10,000}} = 10$ |
| D | $10^{-4} = \frac{1}{10,000}$ |

- 27** Convert the given logarithm to the equivalent in exponent form

$$\log_{\frac{1}{9}} \frac{1}{81} = 2$$

- | | | | |
|---|----------------------------------|---|----------------------------------|
| A | $2^{\frac{1}{81}} = \frac{1}{9}$ | B | $\frac{1^2}{9} = \frac{1}{81}$ |
| C | $\frac{1^2}{81} = \frac{1}{9}$ | D | $2^{\frac{1}{9}} = \frac{1}{81}$ |

- 28** Convert the given exponent to the equivalent in logarithm form

$$5^{2.6} = 66$$

- | | |
|---|---------------------|
| A | $\log_{2.6} 5 = 66$ |
| B | $\log_5 66 = 2.6$ |
| C | $\log_{66} 2.6 = 5$ |
| D | $\log_{2.6} 66 = 5$ |

- 29** Solve the following logarithm

$$\log_{\frac{1}{10}} \frac{1}{100,000} = x$$

- | | | | |
|---|----------|---|---------|
| A | $x = 12$ | B | $x = 5$ |
| C | $x = 7$ | D | $x = 3$ |
| E | $x = -2$ | F | $x = 4$ |

- 30** Convert the given logarithm to the equivalent in exponent form

$$\log_2 8 = 3$$

- | | | | |
|---|-----------|---|-----------|
| A | $2^3 = 8$ | B | $3^8 = 2$ |
| C | $3^2 = 8$ | D | $8^3 = 2$ |



Logarithmic Concepts

31 Solve the following logarithm

$$\log_8 17,559.94 = x$$

A $x = 3.7$

B $x = 2.7$

C $x = 6.7$

D $x = 5.7$

E $x = 4.7$

32 Solve the following logarithm

$$\log_3 9 = x$$

A $x = 0$

B $x = 1$

C $x = 2$

D $x = 3$

E $x = 4$

33 Solve the following logarithm

$$\log_{10} \frac{1}{100,000} = x$$

A $x = -7$

B $x = 4$

C $x = 2$

D $x = -15$

E $x = -6$

F $x = -5$

34 Simplify and solve for y

$$\log_4 (3y - 5) = 3$$

A $y = 25$

B $y = 22$

C $y = 23$

D $y = 24$

35 Simplify and solve for q

$$\log_3 \left(\frac{q + 56}{q} \right) = 2$$

A $q = 6$

B $q = 7$

36 Simplify and solve for t

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

A $t = 9$

B $t = 10$

37 Use a logarithm to solve for the missing exponent

$$8^x = 427$$

A $x = 3.91$

B $x = 1.91$

C $x = 0.91$

D $x = 4.91$

E $x = 2.91$

38 Use a logarithm to solve for the missing exponent

$$2^x = 29.86$$

A $x = 2.9$

B $x = 5.9$

C $x = 6.9$

D $x = 3.9$

E $x = 4.9$