

Precalculus - Logarithms and Their Properties - Quiz

Common Core F-LE.A.4, F-IF.C.7e, F-BF.B.5 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Pick the best answer for 10 questions on logarithms. Explanations name common mistakes, such as treating $\log(A + B)$ like $\log A$ plus $\log B$.

Precalculus · Common Core State Standards: **F-LE.A.4, F-IF.C.7e, F-BF.B.5**

Questions

Question 1

What is $\log_2 32$?

- A. 5
- B. 16
- C. 6
- D. 2.5

Question 2

Which is the exponential form of $\log_4 16 = 2$?

- A. $2^4 = 16$
- B. $16^2 = 4$
- C. $4^2 = 16$
- D. $4^{16} = 2$

Question 3

What is $\log 0.001$?

- A. -3
- B. 3
- C. -2
- D. $\frac{1}{3}$

Question 4

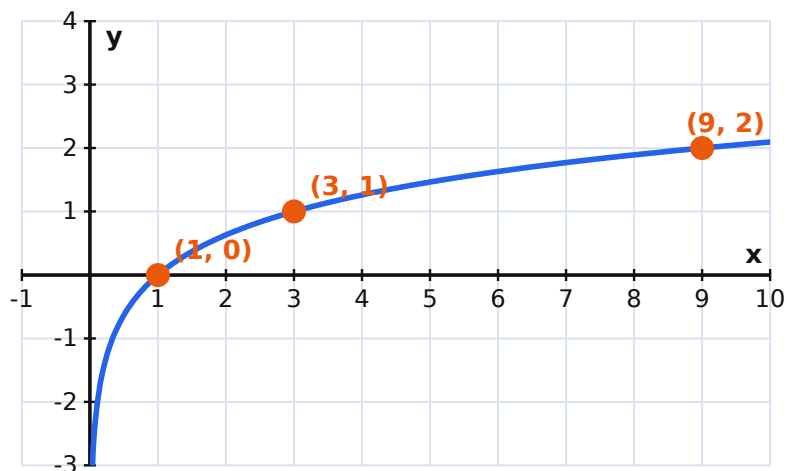
Which expression equals $\log_b M + \log_b N$?

- A. $\log_b (M + N)$
- B. $\log_b M \cdot \log_b N$

- C. $\frac{\log_b M}{\log_b N}$
 D. $\log_b(MN)$

Question 5

The graph shows $y = \log_3 x$. What is its vertical asymptote?



Graph of a logarithm.

- A. $y = 0$
 B. $x = 1$
 C. $y = 1$
 D. $x = 0$

Question 6

Expand $\log_3(9x^2)$.

- A. $2 + 2\log_3 x$
 B. $2\log_3 9x$
 C. $9 + 2\log_3 x$
 D. $2\log_3 x$

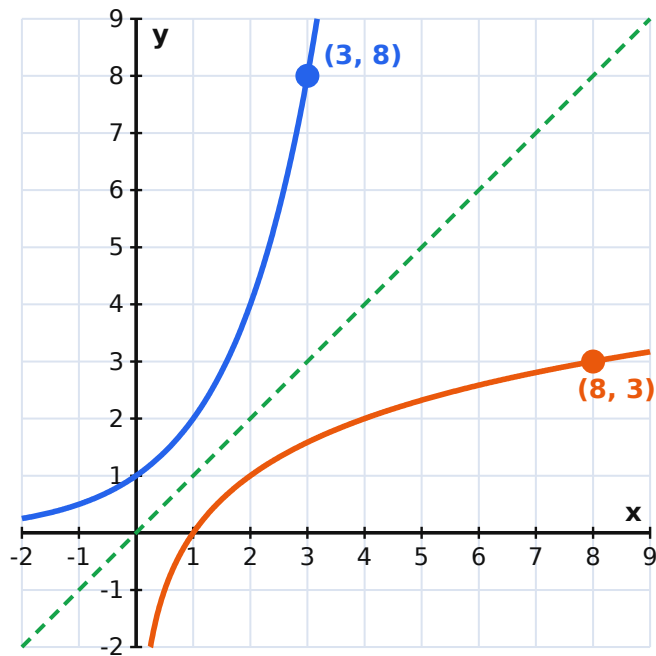
Question 7

Which is the domain of $f(x) = \log(x+4)$?

- A. $x > 4$
 B. $x > -4$
 C. $x \geq -4$
 D. All real numbers

Question 8

The figure shows an exponential and its inverse. Which point is on the log graph?



Graphs of 2^x and $\log_2 x$.

- A. $(3, 8)$
- B. $(-3, 8)$
- C. $(8, 3)$
- D. $(8, -3)$

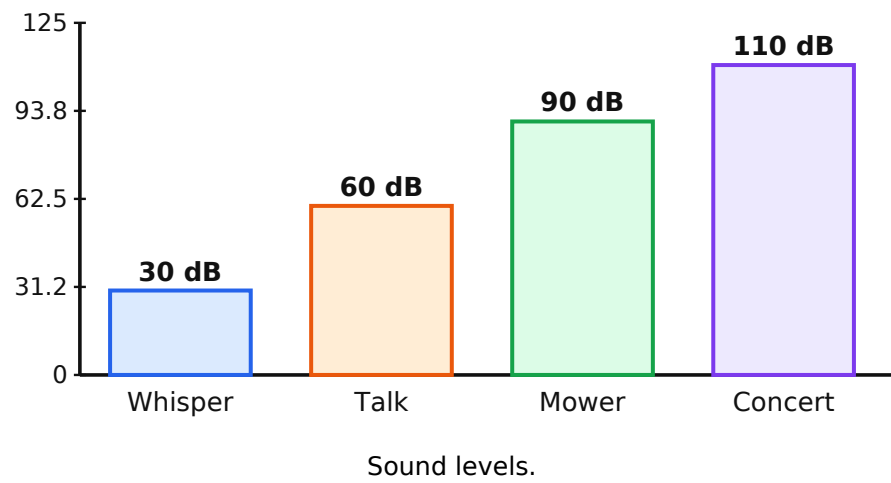
Question 9

Evaluate $\log_5 5$.

- A. 0
- B. 1
- C. 5
- D. 25

Question 10

A concert is 110 dB and a lawn mower is 90 dB, as shown. How many times more intense is the concert?



- A. 20
- B. 100
- C. 2
- D. 10

Answers

1. **A** - $2^5 = 32$, so the logarithm is 5.
2. **C** - The base is 4 and the log 2 is the exponent.
3. **A** - $0.001 = 10^{-3}$, so the logarithm is -3.
4. **D** - The product rule says the sum of logs is the log of the product.
5. **D** - The y-axis, $x = 0$, is the vertical asymptote of every basic logarithm.
6. **A** - $\log_3 9 = 2$ and the power rule gives $2 \log_3 x$. Dropping the 9 loses the 2.
7. **B** - The argument $x + 4$ must be positive, so $x > -4$.
8. **C** - $(3, 8)$ is on 2^x . The inverse swaps coordinates, giving $(8, 3)$.
9. **B** - A base raised to the first power equals itself, so $\log_b b = 1$.
10. **B** - The difference is 20 dB. Each 10 dB is a factor of 10, so 20 dB is 10 times 10 = 100.

Remember

- $\log_b x = y$ if and only if $b^y = x$ ($b > 0$, $b \neq 1$, $x > 0$).
- $\log_b 1 = 0$ and $\log_b b = 1$.
- Product rule adds logs, quotient rule subtracts, power rule multiplies.
- Change of base: $\log_b M = \ln M / \ln b$.
- The graph of $\log_b x$ has the vertical asymptote $x = 0$ and passes through $(1, 0)$.