

Sample questions to help prepare for Quiz 1

Answers will not be provided

1. Which of the following is correct?

- A. $y \log_x(ab) = \log_x(a^y) + \log_x(b^y)$
- B. $\log_{xy}(ab) = \log_x(ab) + \log_y(ab)$
- C. $\log_x((a+b)y) = \log_x(ay) + \log_y(by)$
- D. None of the above

2. Which of the following is true given functions $f(n), g(n)$?

- A. $f(n)g(n) = O(f(n) + g(n))$.
- B. If $f(n) = n^k$ and $g(n) = n^{k+1}$ then one can find constants c and N such that $g(n) \leq cf(n)$ for $n > N$.
- C. It is possible that $f(n) = \Theta(g(n))$ and $f(n) = ng(n)$ are both true.
- D. It is possible that neither $f(n) = O(g(n))$ nor $g(n) = O(f(n))$.

3. Which of the following is true?

A.

$$1 + x + x^2 + \dots + x^n = \frac{x^n - 1}{x - 1}$$

B.

$$1 + x^2 + x^4 + \dots + x^{2n} = \frac{1 - (x^2)^{n+1}}{1 - x^2}$$

C.

$$2^{\log_{10} 2} = 1$$

D.

$$\log(1 + 2 + \dots + n) = \sum_{k=1}^n \log(k)$$

4. Which of the following statements is correct?

- A. $100n^2 = \Omega(n^3)$
- B. $n \log n = O(n)$
- C. $2^n = \Theta(3^n)$
- D. $\log_2(n^2) = \Theta(\log_2 n)$