

Logarithms and Exponentials Test Questions:

1. For all x , $\ln(e^x) = x$. True or False

2. $e^a e^b = (e^a)^b$ is true for all values of a and b . True or False

3. If $M > 0$ and $N > 0$, then

$$\ln\left(\frac{M}{N}\right) = \ln M - \ln N.$$

True or False

4. If $\log_3 x + \log_3(x - 6) = 3$, then

A. $x = -3$ only B. $x = 9$ only C. $x = 9$ or $x = -3$ D. $x = 16.5$ only

5. Let $f(x) = \ln(x^2 + 1)$. Consider the following four statements about the graph of f :

- I. It is symmetric with respect to the x -axis.
- II. It is symmetric with respect to the y -axis.
- III. It is always increasing.
- IV. It is always decreasing.

How many of these four statements are true?

A. one B. two C. three D. four

6. Let $f(x) = -e^{-3x}$. Consider the following four statements about the graph of f :

- I. It is symmetric with respect to the x -axis.
- II. It is asymptotic to the x -axis.
- III. It is always increasing.
- IV. It is always decreasing.

How many of these four statements are true?

A. one B. two C. three D. four

7. If $4^{3x-1} = 8^{3x+3}$, then $x =$

A. $\frac{11}{3}$ B. 2 C. $-\frac{11}{3}$ D. $-\frac{7}{3}$