AP Calculus Exponential & Log Functions

Name: _____ **Date:** _____

1. Which of the following is equal to $e^{\ln x + \ln 3}$?

   A. $3x$ B. 3^{10x} C. x^{30} D. $\ln \frac{x}{3}$

2. Choose the expression equivalent to $\ln\left(\frac{3x^2}{7y}\right)$.

   A. $\frac{\ln 3 + \ln x^2}{\ln 7 + \ln y}$

   B. $\ln(3x^2) + \ln(7y)$

   C. $\ln 3 - \ln 7 + 2\ln x - \ln y$

   D. $\ln\left(\frac{3}{7}\right) + \ln\left(\frac{x}{y}\right)^2$

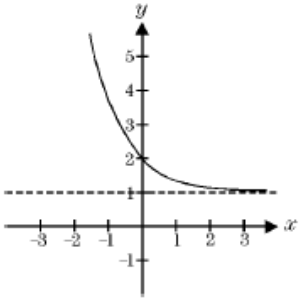
3. Which of the following is equal to $e^{\ln(e^2)}$?

   A. e^2 B. e^{e+2} C. $\frac{e}{2}$ D. 2^e

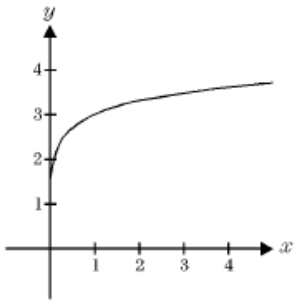
4. Find all value(s) for x such that $\ln x - \ln \frac{1}{x} = 4$.

5. Solve for x: $2^{3x-1} = 5$

6. What is the equation of the graph shown?



7. Which of the following functions could have the graph shown?



   A. $f(x) = 3 + \log x$ B. $f(x) = \log(x + 3)$

   C. $f(x) = \frac{1}{3}\log x$ D. $f(x) = 1 + \frac{1}{3}\log x$

8. If $\log_e a = 1 - y$, then $e^y =$

9. Which equation is equivalent to $\ln 7 + 3\ln x = 5\ln 2$?

   A. $\ln 7x^3 = \ln 25$ B. $\ln 7x^3 = \ln 32$

   C. $\ln 10x = \ln 10$ D. $\ln 21x = \ln 10$

10. If $f(x) = 5^{2x+1}$, then the inverse function, $f^{-1}(x)$, is given by

    A. $\log 2x + 1$ B. $\frac{\ln 2x + 1}{\ln 5}$

    C. $5\ln 2x + 1$ D. $(2x + 1)\ln 5$

11. Find the constant k so that the exponential function $y = 3e^{kt}$ passes through the points given on the graph.

    A. $\frac{1}{3}\ln\frac{5}{3}$

    B. $\ln\frac{5}{9}$

    C. $\frac{2}{3}\ln\frac{5}{9}$

    D. $\frac{2}{3}\ln\frac{5}{3}$