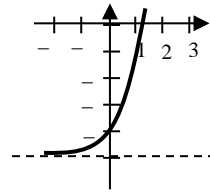


Math Analysis Chapter 3 Practice Test

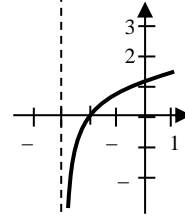
1. Which equation represents the graph to the right?

- (a) $f(x) = 4^x - 5$ (b) $f(x) = 4^x + 5$
 (c) $f(x) = 4^{-x} + 5$ (d) $f(x) = 4^{-x} - 5$



2. Which equation represents the graph to the right?

- (a) $f(x) = -3 + \ln x$ (b) $f(x) = 3 + \ln x$
 (c) $f(x) = \ln(x-3)$ (d) $f(x) = \ln(x+3)$



3. Find the domain, the locator point and the asymptote of (do not graph): $f(x) = \log_3(3x-6) - 1$

For questions 4-9, simplify or solve for x:

4. $\log \frac{1}{1000}$

5. $\log_{16} 8 = x$

6. $5x \log_6 6^{2x}$

7. $3 \log_2 \frac{1}{2}$

8. $\ln e^\pi$

9. $-2 \log_m a - 5 \log_m b + \frac{2}{3} \log_m c$

10. Write expression in terms of logarithms of x, y, and z: $\log_5 \frac{\sqrt[3]{x}}{\sqrt[3]{yz}}$

11. Solve for x: $\log(x+2) + \log(x-1) = 1$.

12. Solve for x: $\log(7-x) - \log(3x+2) = 1$

13. Home value usually appreciate from year to year. If a home in Murrieta was originally purchased for \$200,000 and it has increased about 4% per year:

- a) Find an exponential model that represents this situation.
 b) How many years will it be before the home is worth \$350,000?

14. The spread of the flu virus through a certain population is modeled by $y = \frac{1000}{1 + 990e^{-0.7t}}$ where y is the total number infected after t days. In how many days will 820 people be infected with the virus?

15. Which will yield more money: an investment of \$50,000 at 5% annual interest rate compounded continuously or \$50,000 at 5.75% annual interest rate compounded quarterly?

16. A bottle of spring water with an initial temperature of 85°F is placed in a freezer with a temperature of 10°F. After 20 minutes, the temperature of the water drops to 60°F. The equation for the drop in temperature is

$T_f = T_r + (T_o - T_r)e^{-rt}$, where T_f is the final temperature of the object after t minutes, T_r is the temperature of the surrounding air, T_o is the original temperature of the object, and r is the rate at which the object is cooling.

- a) Find the rate of cooling, r
 b) Based on your rate from part (a) determine how long it will take the water to reach 25°F.
 c) When will the water reach 10°F?