Algebra II-10

Sheet #551 - Ch5 Review

Name _____ Period _____

Note: Make sure you can do each question with or without multiple choices given. Be prepared to do problems without the calculator (recognizing graphs and answering in terms of logs instead of decimals).

Write as the sum or difference of logarithms with no exponents.

1. $\log 57x$

2. $\log n^5$

3. $\log n^3 m^8$

Write as a single logarithm.

4. $\log n - \log 90$

5. $2\log m + 7\log n$

6. Use the formula $\log_b M = \dfrac{\log_a M}{\log_a b}$ to find $\log_5 137$ to the nearest thousandth.

Solve.

7. $2^{3x} = 64$

8. $5 = 2e^{1+x}$

9. $\log_2(4 - 5x) = 2$

10. The future value of an investment of P dollars earning an annual interest of r can be calculated with the formula $A = P\left(1 + \dfrac{r}{n}\right)^{nt}$, where t is the number of years of the investment and n is the number of compounding periods per year. Find the future value of \$2000 if it is invested for 4 years at an annual interest rate of 10% compounded every 3 months.

11. Which of the following functions could have the graph sketched here?

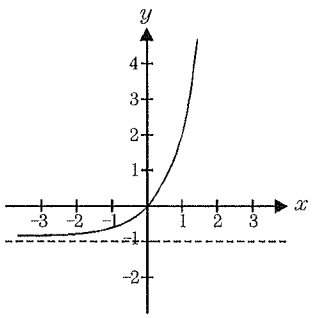
A) $y = 3^{x-1}$

B) $y = 3^x - 1$

C) $y = 3^{1-x}$

D) $y = 3^{-x} - 1$

E) $y = e^{3x} - 1$



12. Which of the following functions could have the graph sketched here?

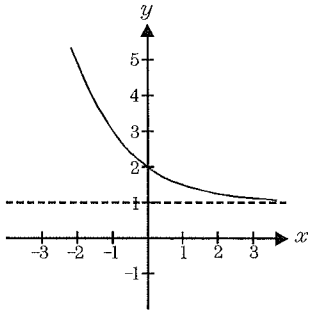
A) $f(x) = (\frac{1}{2})^x - 1$

B) $f(x) = 2^x + 1$

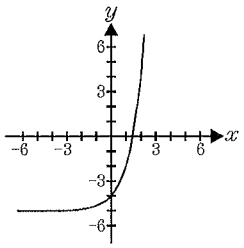
C) $f(x) = 2^{-x} + 1$

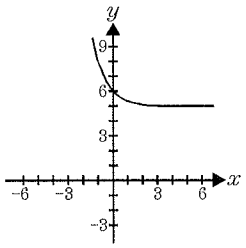
D) $f(x) = 3^{-x}$

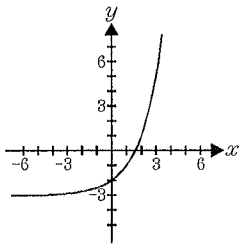
E) $f(x) = 3^x - 1$

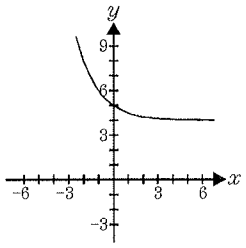


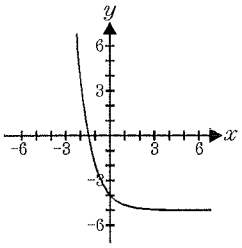
13. Which of the following could be the graph of $f(x) = 3^{-x} + 5$?

A) 

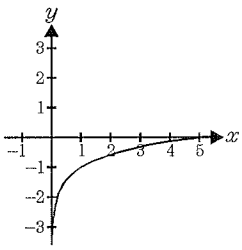
B) 

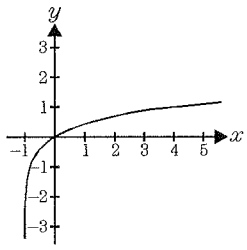
C) 

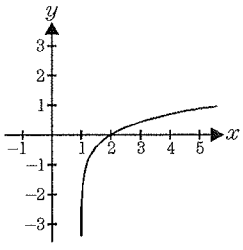
D) 

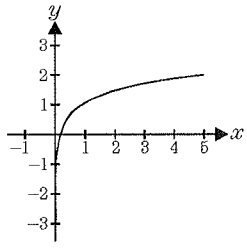
E) 

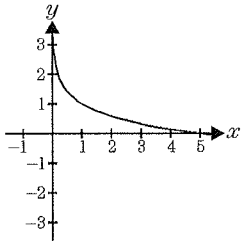
14. Which of the following is the graph of $f(x) = \log_5(x+1)$?

A) 

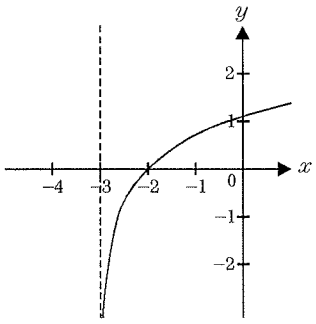
B) 

C) 

D) 

E) 

15. Which of the following functions could have the graph sketched here?



A) $f(x) = -3 + \ln x$ B) $f(x) = 3 + \ln x$
C) $f(x) = \ln(x-3)$ D) $f(x) = \ln(x+3)$
E) $f(x) = 2 + \ln(x-3)$

16. Which of the following is equal to $e^{\ln 5 + \ln x}$?

A) $\log \dfrac{5}{x}$ B) x^{50} C) 5^{10x}
D) e^{5x} E) $5x$

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

A) $y^3(x-2)^2$ B) $2^{3y(x-2)}$
C) $e^{6+\ln(x+y-2)}$ D) $\ln 3y^2(x-2)$
E) $\dfrac{\ln_3 y}{\ln_2(x-2)^4}$

18. Choose the expression equivalent to $\ln\left(\dfrac{8x^2}{3y}\right)$.

A) $\ln 8 - \ln 3 + 2\ln x - \ln y$
B) $\dfrac{\ln 8 + \ln x^2}{\ln 3 + \ln y}$
C) $\ln(8x^2) + \ln(3y)$
D) $2\ln(8x) - \ln(3y)$
E) $\ln\left(\dfrac{8}{3}\right) + \ln\left(\dfrac{x}{y}\right)^2$

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

A) $\frac{8}{3}$ B) $\frac{1}{5}\ln 6$

C) $\frac{1}{5}\left[\frac{\ln 3}{\ln 2} + 1\right]$ D) $\frac{1}{5}\left[1 - \ln(\frac{2}{3})\right]$

E) $\frac{1}{5}\left[\ln(\frac{2}{3} + 1)\right]$

20. A fish population is increasing at a rate of 5% a year. How many fish will there be in 9 years, to the nearest thousand fish, if there are 17 thousand now?

A) 41 B) 45 C) 26 D) 85 E) 23

21. A radioactive element has a half-life of 60 days. What percentage of the original sample is left after 45 days?

A) 25.00% B) 35.91% C) 59.46%

D) 66.23% E) 75.00%

22. A deposit of \$3,000 is made into a fund with an annual interest rate of 12 percent. Find the time (in years) necessary for the investment to triple if the interest is compounded continuously. Round your answer to 2 decimal places.

A) 8.58 B) 9.16 C) 7.23 D) 12 E) 6

23. A mold culture doubles its mass every seven days. Find the growth model for a plate seeded with 0.9 grams of mold.

A) $y = 0.9e^{0.09902t}$ B) $y = 0.9e^{0.12183t}$

C) $y = 0.9e^{0.38541t}$ D) $y = 0.9e^{0.45128t}$

E) $y = 0.9e^{0.81818t}$