

6.1 – 6.3 Review Worksheet

Tell whether the function represents *exponential growth* or *exponential decay*. Explain your reasoning. (Sections 6.1 and 6.2)

1. $f(x) = (4.25)^x$

growth
 $b > 1$

2. $y = \left(\frac{3}{8}\right)^x$

decay
 $0 < b < 1$

3. $y = e^{0.6x}$

growth
 $r > 1$

4. $f(x) = 5e^{-2x}$

decay
 $r < 1$

Simplify the expression. (Sections 6.2 and 6.3)

5. $e^8 \cdot e^4$

e^{12}

6. $\frac{15e^3}{3e}$

$5e^2$

7. $(5e^{4x})^3$

$125e^{12x}$

8. $e^{\ln 9}$

9

9. $\log_7 49^x$

$2x$

10. $\log_3 81^{-2x}$

$-8x$

Rewrite the expression in exponential or logarithmic form. (Section 6.3)

11. $\log_4 1024 = 5$

$4^5 = 1024$

12. $\log_{1/3} 27 = -3$

$\left(\frac{1}{3}\right)^{-3} = 27$

13. $7^4 = 2401$

$\log_7 2401 = 4$

14. $4^{-2} = 0.0625$

$\log_4 0.0625 = -2$

Evaluate the logarithm. (Section 6.3)

15. $\log_2 32 = 5$

(because $2^5 = 32$)

16. $\log_6 1 = 0$

(because $6^0 = 1$)

17. $\ln \frac{1}{e^7} = -7$

(because $e^{-7} = \frac{1}{e^7}$)

18. $\log_{81} 27 = \frac{3}{4}$

(because $81^{3/4} = 27$)

For each function, find the inverse function, $g(x)$. (Section 6.3)

19. $f(x) = \left(\frac{1}{9}\right)^x$

$g(x) = \log_{\frac{1}{9}} x$

20. $f(x) = \ln(x - 7)$

$g(x) = e^x + 7$

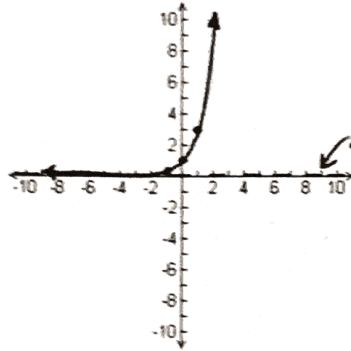
21. $f(x) = \log_5(2x)$

$g(x) = \frac{5^x}{2}$

Tell whether the function represents growth or decay. Then graph the function (include a minimum of three points and any asymptotes). (Section 6.1)

22. $f(x) = 3^x$

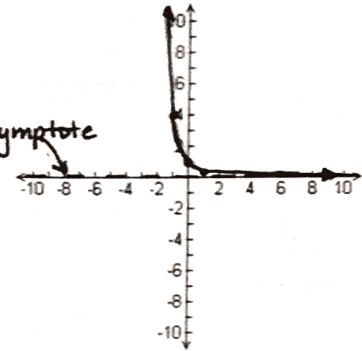
growth



23. $f(x) = \left(\frac{1}{4}\right)^x$

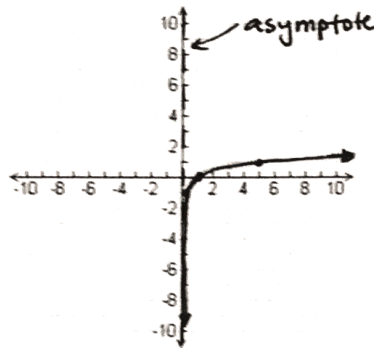
decay

asymptote

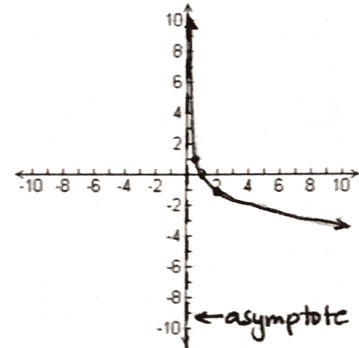


Graph each logarithmic function (include a minimum of three points and any asymptote). (Section 6.3)

24. $f(x) = \log_5 x$



25. $f(x) = \log_{1/2} x$



26. You purchase an antique lamp for \$150. The value of the lamp increases by 2.15% each year. (Section 6.1)

a. Write an exponential model that gives the value y (in dollars) of the lamp t years after you purchased it.

$$y = 150(1.0215)^t$$

b. According to your model, how much will the lamp be worth in 10 years?

\$185.56

27. A local bank advertises two certificate of deposit (CD) accounts that you can use to save money and earn interest. The interest is compounded monthly for both accounts. You deposit the minimum required amounts in each CD account. (Section 6.1)

a. How much money is in the CD Specials account at the end of its term?

\$1592.68

CD Specials	2.0% annual interest
36/mo CD • \$1500 Minimum Balance	
Anytown Community Bank	3.0% annual interest
60/mo CD • \$2000 Minimum Balance	

b. How much money is in the Anytown Community Bank account at the end of its term?

\$2323.23