

Chapter 4 Test Review

Write each exponential equation in logarithmic form.

1) $\left(\frac{3}{4}\right)^x = 5$

2) $49^{\frac{1}{2}} = 7$

3) $1.2^0 = 1$



Write each logarithmic equation in exponential form.

4) $\log_{15} 225 = 2$

5) $\log_{64} 2744 = \frac{3}{4}$

6) $\log_{\frac{1}{12}} 1728 = -3$



Express as a single logarithm. Simplify if possible.

7) $\log_3 3 + \log_3 27$



8) $\log 100 + \log 1000$

9) $\log_4 320 - \log_4 5$



10) $\log_2 80 - \log_2 10$

11) $\log_3 27^4$



12) $\log_4 1024^5$

13) $\log_8 8^2$



14) $\log_2 4^3$

15) $\log_2 2^{\frac{x}{2}+5}$

16) $2.5^{\log_{2.5} x}$

Evaluate.

17) $\log_9 \left(\frac{1}{27}\right)$

18) $\log_8 32$

19) $\log_2 27$



Write inverse functions using inverse operations.

20) $y = -\frac{2}{3}x - \frac{8}{3}$

21) $y = \frac{-25-9x}{5}$



22) $y = -2x + 4$

23) $y = -2 + \frac{7}{5}x$

Use the given x - values to graph each function. Graph the function and determine if it shows growth or decay. Then graph the inverse of the function. Find the domain and range of each function.



24) $f(x) = (0.5^x)$

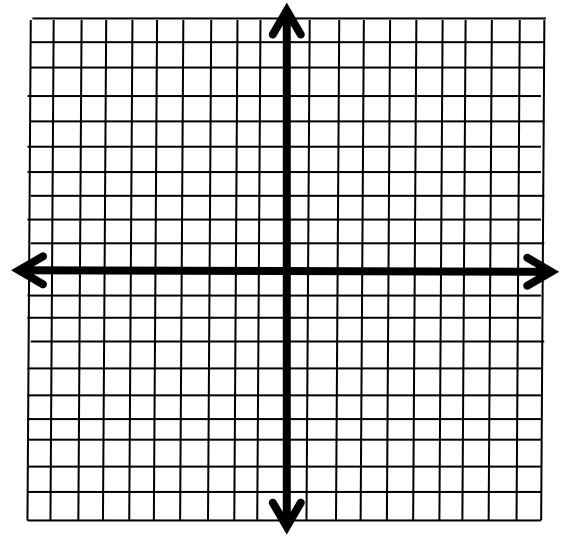
x	-3	-2	-1	0	1	2
$f(x)$						

Domain: _____ Range: _____

Growth or decay? _____

x						
$f(x)$						

Domain: _____ Range: _____



25) $f(x) = 0.5(1.2^x)$

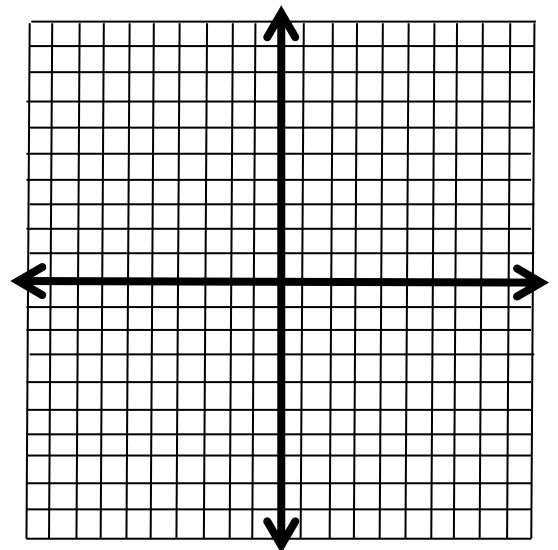
x	-9	0	4	6	8	10
$f(x)$						

Domain: _____ Range: _____

Growth or decay? _____

x						
$f(x)$						

Domain: _____ Range: _____



Solve each logarithmic equation.

$$26) \log_2\left(1 + \frac{x}{2}\right) = 4$$



$$27) \log_5 x^4 = 2.5$$



$$28) \log_7(-3x) - \log_7 9 = 1$$



$$29) \log_7 5 + \log_7(x + 1) = 1$$



$$30) \log(x^2 - 9) = \log(5x + 5)$$



$$31) \log_4(-4x) + \log_4 6 = 3$$

Solve each exponential equation.

$$32) 3^{3r} = 89$$

$$33) 13^{b-2} = 40$$



$$34) 9^{2x} = 27^{x+4}$$

$$35) 4^{-2x} = 64$$



Graph each function in the calculator and determine if it show growth or decay.

$$36) f(x) = 2.4(3)^x$$

$$37) f(x) = 2(0.8)^x$$

$$38) f(x) = 1.9\left(\frac{5}{2}\right)^x$$

$$39) f(x) = 4\left(\frac{2}{7}\right)^x$$



Simplify.

$$40) \ln e^0$$

$$41) \ln e^{2a}$$

$$42) e^{\ln(x+2)}$$

$$43) e^{4\ln x}$$



Use $A(t) = a(1 \pm r)^t$ to solve each problem.

44) A diamond ring was purchased 20 years ago for \$500. The value of the ring increased 8% each year. When will the ring be worth \$10,000? ($x_{\min} = 10$, $x_{\max} = 50$, $y_{\min} = 500$, $y_{\max} = 15,000$)



45) A business purchased a piece of equipment for \$250,000. The value of the equipment depreciates at a rate of 12% each year. When will the piece of equipment be worth \$150,000? ($x_{\min} = 0$, $x_{\max} = 10$, $y_{\min} = 100,000$, $y_{\max} = 200,000$)

Use the appropriate formula to solve each problem.

Compound Interest	Continuous Interest	Population Growth
$A = P\left(1 + \frac{r}{n}\right)^{nt}$	$A = Pe^{rt}$	$A = Pe^{rt}$

46) Aidan has \$7,565 in his checking account. He invests \$5000 of it in an account that earns 3.5% interest compounded continuously. What is the total amount of his investment after 3 years?



47) What is the balance after 10 years if you deposit \$900 in an account that pays 7% interest compounded semi - annually?

48) Marion decides to invest \$1000 at 5% interest compounded continuously. Find the value of the investment after two years.

49) What is the balance after 8 years if you deposit \$1400 in account that pays 6% interest compounded quarterly?

50) A type of bacteria has a very high exponential growth rate at 80% every hour. If there are 10 bacteria, determine how many there will be in 1 day.

