

## CHAPTER

## 7

## Chapter Test

## Form A

Select the best answer.

- Which function is an example of exponential growth?
  - $a(x) = 0.5(1.2)^x$
  - $b(x) = 2.4(0.86)^x$
- Ted's comic book collection, which was worth \$1300 five years ago, has been increasing in value by 12% per year since then. Which expression gives the current value of the collection?
  - $1300(1.12)^5$
  - $1300(.12)^5$
  - $1300(1.12)(5)$
  - $1300[1 + (.12)(5)]$
- The student population of Gloomy Valley High School has been steadily decreasing by 2% per year. If its population 8 years ago was 1200, which is the best expression for its population now?
  - $1200 - 1200(.02)^8$
  - $1200(.98)^8$
- If  $g(x)$  is the inverse of  $f(x) = \sqrt{x^3 + 1}$ , which of the following is on  $g(x)$ ?
  - (2, 3)
  - (3, 2)
- Which statement is NOT always true?
  - The inverse of a linear function is a function.
  - The inverse of a quadratic function is not a function.
  - If a function has two  $x$ -intercepts, then its inverse has two  $y$ -intercepts.
  - The inverse of an exponential function is a logarithmic function.
- Which is the inverse of  $f(x) = \sqrt{2x + 5}$ ?
  - $a(x) = x^2 - \frac{5}{2}$
  - $b(x) = \frac{(x - 5)^2}{2}$
  - $c(x) = \frac{x^2}{2} - 5$
  - $d(x) = \frac{x^2 - 5}{2}$
- Which is the inverse of  $f(x) = 6^x$ ?
  - $f^{-1}(x) = \log_x 6$
  - $f^{-1}(x) = \log_6 x$
  - $f^{-1}(x) = \frac{\log x}{6}$
  - $f^{-1}(x) = 6 \log x$
- Which is the logarithmic form of  $2^{10} = 1024$ ?
  - $\log_2 10 = 1024$
  - $\log_2 1024 = 10$
- Evaluate  $\log_8 32$ .
  - $\frac{3}{5}$
  - $\frac{5}{3}$
- Express  $2 \log 4 + 3 \log 2$  as a single logarithm.
  - $6 \log 8$
  - $\log 48$
  - $5 \log 6$
  - $\log 128$
- Which is the greatest?
  - $\log_2 32^8$
  - $\log_3 27^{13}$
  - $\log_4 2^{50}$
  - $\log_5 25^{19}$
- Simplify  $\log 10^9 + 10^{\log 9}$ .
  - 18
  - 81
- Which is equal to  $\log_5 100$ ?
  - $\frac{2}{\log 5}$
  - $\frac{100}{\log 5}$
- Solve  $4^{4x-5} = 8^{3x-4}$ .
  - $x = \frac{3}{2}$
  - $x = 2$
- Solve  $3^{2x} = 30$ .
  - $\frac{\log_3 30}{2}$
  - $\log_3 15$
  - $2 \log_3 30$
  - $\log_3 60$

**CHAPTER 7** **Chapter Test**  
**Form A** continued

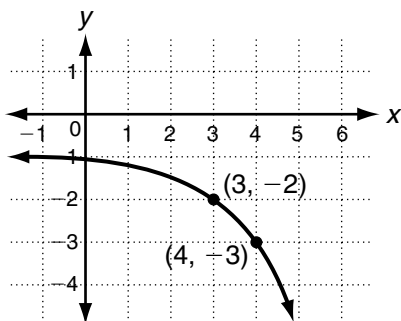
16. What is the solution set to the equation  $\log_2(3x + 1) + \log_2(x + 7) = 5$ ?

- A {1}
- B  $\{-\frac{25}{3}, 1\}$

17. Which is equal to  $e^{\ln 3} + \ln e^4$ ?

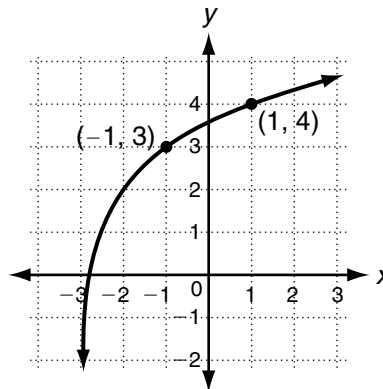
- A 7
- B 12

18. What could be the function shown in the graph?



- A  $f(x) = -2^{x-3} + 1$
- B  $g(x) = -2^{x-3} - 1$
- C  $h(x) = 2^{3-x} + 1$
- D  $h(x) = 2^{3-x} - 1$

19. What could be the function shown in the graph?



- A  $a(x) = \log_2(x - 3) + 2$
- B  $a(x) = \log_2(x + 3) + 2$
- C  $c(x) = \log_2(x - 2) + 3$
- D  $d(x) = 2\log_2(x + 2) + 3$

20. If the data below is from an exponential function, what is the value of  $a$ ?

<b>x</b>	3	5	7
<b>y</b>	8	$a$	18

- A 12
- B 12.5
- C 13
- D 13.5

21. Evaluate  $f(1)$  for  $f(x) = \ln x$ .

- A 0
- B 1

22. The data below is from an exponential function. What is the value of the constant ratio?

<b>x</b>	-1	0	1	2	3
<b>y</b>	2	4	8	16	32

- A -1
- B 1
- C 2
- D 4

## CHAPTER

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## Chapter Test

## Form B

Select the best answer.

- Which of the following functions is an example of exponential decay?  
**A**  $a(x) = 0.5(1.2)^x$     **C**  $c(x) = 0.5(x)^{0.9}$   
**B**  $b(x) = 2.4(0.86)^x$     **D**  $d(x) = \log_{0.5} x$
- Which expression shows the value of a rare postage stamp, originally purchased for \$5000, that has been increasing in value by 11% for 10 years?  
**F**  $5000(0.11)^{10}$   
**G**  $5000(1.11)^{10}$   
**H**  $5000(11)^{10}$   
**J**  $5000(1.11)(10)$
- A balloon with a small leak loses 1% of its volume each day. If it originally contained 24 liters of gas, what is the volume of the gas after one week?  
**A**  $24(.01)^7$                       **C**  $24(.01)^8$   
**B**  $24(.99)^7$                       **D**  $24(.99)^8$
- If  $g(x)$  is the inverse of  $f(x) = x^x$ , which of the following is on  $g(x)$ ?  
**F**  $(-1, 1)$                       **H**  $(27, 3)$   
**G**  $(2, 4)$                         **J**  $(64, 4)$
- Which of the statement is ALWAYS true?  
**A** The inverse of a linear function is a function.  
**B** The inverse of a quadratic function is a function.  
**C** The inverse of a cubic function is a function.  
**D** The inverse of a logarithmic function is a function.
- Which is the inverse of  $f(x) = \sqrt{2x-3} + 2$ ?  
**F**  $a(x) = \frac{(x-2)^2}{2} + 3$   
**G**  $b(x) = \frac{x^2 + 1}{2}$   
**H**  $c(x) = (2x - 3)^2 - 2$   
**J**  $d(x) = \frac{(x-2)^2 + 3}{2}$
- Which of the following is the inverse of  $f(x) = 2(3^x)$ ?  
**A**  $f^{-1}(x) = 2\log_3 x$   
**B**  $f^{-1}(x) = \log_3 \frac{x}{2}$   
**C**  $f^{-1}(x) = \frac{\log_3 x}{2}$   
**D**  $f^{-1}(x) = \log_6 x$
- Which is the logarithmic form of  $3^6 = 729$ ?  
**F**  $\log_3 729 = 6$                 **H**  $\log 3^6 = 729$   
**G**  $\log_3 729 = 3^6$               **J**  $\log_3 6 = 729$
- Evaluate  $\log_{0.25} 2$ .  
**A**  $-\frac{1}{2}$                               **C** 0.0625  
**B**  $-\frac{1}{8}$                               **D** 8
- Express  $\log_4 27 - 2\log_4 3$  as a single logarithm.  
**F**  $\log_4 3$                         **H**  $\log_4 12$   
**G**  $\log_4 6$                         **J**  $\log_4 18$
- Which of the following is the largest?  
**A**  $\log_{0.5} 8^{40}$                       **C**  $\log_3 27^{12}$   
**B**  $\log_2 32^8$                         **D**  $\log_4 2^{60}$
- Simplify  $\log 10^{36} - 2(10^{\log 12})$ .  
**F**  $-108$                         **H** 1.5  
**G** 0.25                        **J** 12
- Simplify  $\log_5 4 + \log_5 250$ .  
**A**  $\frac{3}{\log 5}$                         **C**  $\frac{\log_5 1000}{\log 5}$   
**B**  $\log_5 254$                       **D**  $\log_{25} 1000$
- Solve  $4^{4x-1} = 32^{2x-1}$ .  
**F**  $x = \frac{7}{12}$   
**G**  $x = \frac{5}{4}$   
**H**  $x = \frac{3}{2}$   
**J** There is no solution.

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**Chapter Test**

**Form B** continued

15. Solve  $3^{x+1} = 100$ .

**A**  $\frac{2 - \log 3}{\log 3}$                       **C**  $\frac{2 - \ln 3}{\ln 3}$

**B**  $\frac{2 + \log 3}{\log 3}$                       **D**  $\frac{2 + \ln 3}{\ln 3}$

16. What is the sum of the solutions of the equation  $\log_2(x - 1) + \log_2(4x + 2) = 2$ ?

**F**  $-\frac{1}{3}$                                       **H**  $\frac{1}{2}$

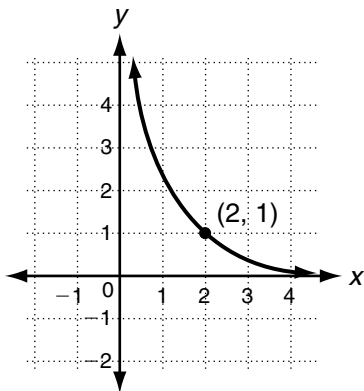
**G**  $\frac{1}{3}$                                         **J**  $\frac{3}{2}$

17. Simplify  $e^{2 \ln x} + \ln e^x$ .

**A**  $3x$                                       **C**  $2x^2$

**B**  $x^2 + x$                                 **D**  $x^3$

18. What could be the function shown in the graph?



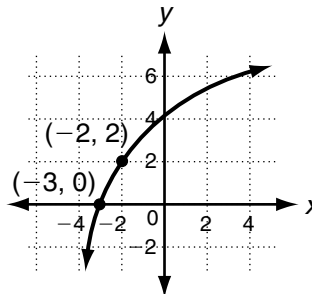
**F**  $f(x) = e^{-x-2}$

**G**  $g(x) = e^{2-x}$

**H**  $h(x) = 2^{-x-2}$

**J**  $h(x) = 2^{2-x}$

19. What could be the function shown in the graph?



**A**  $a(x) = \log_2(x + 4)$

**B**  $b(x) = 2\log_2(x + 4)$

**C**  $c(x) = \log_2(x + 3) + 2$

**D**  $d(x) = 2\log_2(x + 3) + 2$

20. If the data below is from an exponential function, what is the value of  $a$ ?

<b>x</b>	3	5	7
<b>y</b>	4	$a$	10

**F** 6

**H**  $6\sqrt{3}$

**G**  $2\sqrt{10}$

**J** 7

21. What is the  $x$ -intercept of the function  $f(x) = \ln x$ ?

**A** 0

**B** 1

**C**  $e$

**D** does not exist

22. The data below is from an exponential function. What is the value of the constant ratio?

<b>x</b>	-2	0	2	4	6
<b>y</b>	$\frac{1}{4}$	1	4	16	64

**F** -4

**G**  $\frac{1}{2}$

**H** 2

**J** 4

## CHAPTER

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## Chapter Test

## Form C

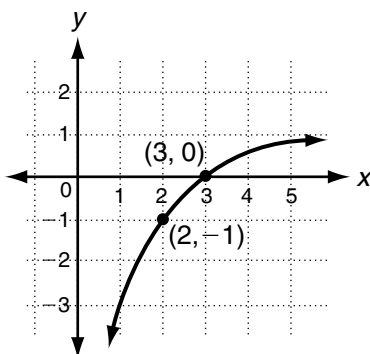
Select the best answer.

1. Which function is an example of exponential decay?  
**A**  $a(x) = 0.5(\sqrt{2})^x$  **C**  $c(x) = \sqrt{5}(x)^{0.9}$   
**B**  $b(x) = 2.4\left(\frac{\sqrt{3}}{2}\right)^x$  **D**  $d(x) = \ln(x^{0.9})$
2. Which function shows the value over time of a certain investment ( $I_0$ ) at  $n\%$ ?  
**F**  $f(x) = I_0\left(1 + \frac{n}{100}\right)^x$   
**G**  $f(x) = I_0(1 + n)^x$   
**H**  $f(x) = I_0 + I_0\left(\frac{n}{100}\right)^x$   
**J**  $f(x) = I_0 + I_0(n)^x$
3. The population of Whoville has been decreasing at a rate of 0.8% per year since Dr. Seuss passed away in 1991. If the population was 13,500 at the beginning of 2005, which expression gives its population at the end of 1998?  
**A**  $13,500(0.992)^{-6}$  **C**  $13,500(1.008)^{-6}$   
**B**  $13,500(0.992)^6$  **D**  $13,500(1.008)^6$
4. If  $g(x)$  is the inverse of  $f(x) = x^{\log_2 x}$ , which of the following is NOT on  $g(x)$ ?  
**F** (1, 1) **H** (4, 16)  
**G** (2, 2) **J** (16, 0.25)
5. Which statement is sometimes, but not always, true?  
**A** The inverse of a quadratic function is a function.  
**B** The inverse of a cubic function is a function.  
**C** The inverse of a logarithmic function is a function.  
**D** The inverse of an exponential function is a function.
6. Which is the inverse of  $f(x) = \frac{x}{x+1}$ ?  
**F**  $a(x) = \frac{1}{1-x}$  **H**  $c(x) = \frac{x+1}{x}$   
**G**  $b(x) = \frac{x}{1-x}$  **J**  $d(x) = \frac{x+1}{x-1}$
7. Which is the inverse of  $f(x) = 2(3^{x+1})$ ?  
**A**  $f^{-1}(x) = \frac{\log_3 x}{2} - 1$   
**B**  $f^{-1}(x) = \log_3 \frac{x}{2} - 1$   
**C**  $f^{-1}(x) = \frac{\log_3 x - 1}{2}$   
**D**  $f^{-1}(x) = \frac{\log_3(x-1)}{2}$
8. If  $a^m = b^n$ , which of the following is NOT true?  
**F**  $\log_a b^n = m$  **H**  $\log_a b = \frac{m}{n}$   
**G**  $\log_b a^m = n$  **J**  $\sqrt{m} = \log_a b^{n/2}$
9. Evaluate  $\log_{0.125} \sqrt[3]{4}$ .  
**A**  $-\frac{4}{3}$  **C**  $-\frac{4}{9}$   
**B**  $-\frac{2}{3}$  **D**  $-\frac{2}{9}$
10. Express  $\log_4 18 - \left(\frac{1}{2}\log_4 36 + 2\log_4 3\right)$  as a single logarithm.  
**F**  $\log_4 \frac{1}{3}$  **H**  $\log_4 6$   
**G**  $\log_4 \frac{1}{2}$  **J**  $\log_4 27$
11. Which is greatest?  
**A**  $\log_{\sqrt{2}} 4^{20}$   
**B**  $\log_{\sqrt{3}} 81^8$   
**C**  $\log_{25} \sqrt{5}^{200}$   
**D**  $\log_{0.5} 16^{50}$
12. Simplify  $\frac{\log 10^{32} - 2(10^{\log 8})}{\log_2 2^{16}}$ .  
**F** 0.5 **H** 1.5  
**G** 1 **J** 2
13. Which of the following is equal to  $(\log_3 25)(\log_4 3)$ ?  
**A**  $\frac{\log 75}{\log 12}$  **C**  $\frac{\log 5}{\log 2}$   
**B**  $\log_{12} 75$  **D**  $\log_2 5$
14. Solve  $4^{2x-5} = 0.5^{2-2x}$ .  
**F**  $x = -\frac{1}{2}$  **H**  $x = 4$   
**G**  $x = \frac{7}{6}$  **J** There is no solution.

**CHAPTER 7** **Chapter Test**  
**Form C** continued

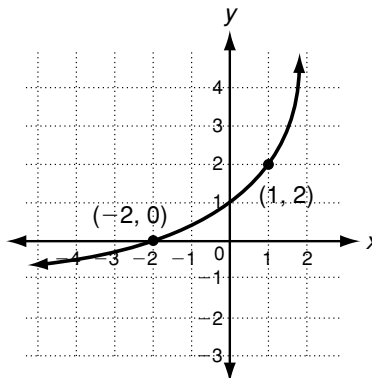
15. Solve  $\left(\frac{3}{2}\right)^x = 3$ .
- A  $\frac{\ln 3}{\ln 3 - \ln 2}$       C  $\frac{\ln 3}{\ln 2} + 1$   
 B  $\frac{\ln 3}{\ln 3 + \ln 2}$       D  $\frac{\ln 3}{\ln 2} - 1$
16. What is the sum of the solutions of the equation  $\log_2(2 - 3x) + \log_2(4x + 6) = 2$ ?
- F  $-\frac{1}{4}$       H  $\frac{1}{2}$   
 G  $\frac{1}{4}$       J  $\frac{5}{4}$
17. Which is equal to  $0.5e^{2\ln x} + 2\ln e^{x^2}$ ?
- A  $3x$       C  $\frac{x^2}{2} + 2x$   
 B  $\frac{x^2}{2}$       D  $x^2 + x$

18. What could be the function shown in the graph?



- F  $f(x) = \log_2(x - 1) - 1$   
 G  $g(x) = -2^{3-x} - 1$   
 H  $h(x) = -2^{x-3} + 1$   
 J  $h(x) = 2^{x-3} + 1$

19. What could be the function shown in the graph?



- A  $a(x) = 2^{x+2} - 1$   
 B  $b(x) = \log_2(2 - x) - 2$   
 C  $c(x) = -\log_2(2 - x) + 2$   
 D  $d(x) = -\log_2(x + 3) - 1$
20. If the data below is from an exponential function, what is the value of  $a$ ?

<b>x</b>	1	2	4
<b>y</b>	8	$a$	24

- F  $8\sqrt[3]{3}$       H  $8\sqrt{3}$   
 G 12      J 16
21. What are the  $x$ -intercepts of the function  $f(x) = \ln(|2x - 5|)$ ?
- A  $\ln 5$  and  $\ln(-5)$   
 B 2 and 3  
 C  $\frac{5}{2}$  and  $-\frac{5}{2}$   
 D do not exist
22. The data below is from an exponential function. What is the value of the constant ratio?

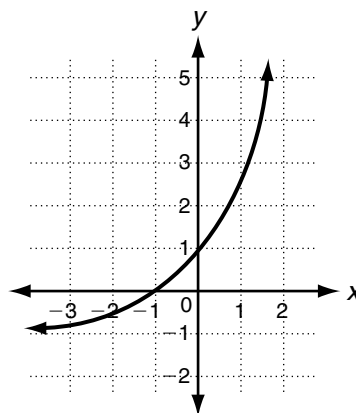
<b>x</b>	-2	0	2	4	6
<b>y</b>	$2.5 \times 10^{-6}$	$5.0 \times 10^{-3}$	10	$2 \times 10^4$	$4 \times 10^7$

- F  $\frac{1}{2}$       H  $10^3$   
 G 2      J  $2 \times 10^3$

**CHAPTER**  
**7** **Chapter Test**  
**Form A**

1. If  $f(x) = a(r)^x$  is an example of exponential growth, what must be true of  $r$ ?  
\_\_\_\_\_
2. Marcus makes an investment of \$2000. Write an expression that shows its value after it increases in value by 8% for 9 years.  
\_\_\_\_\_
3. The population of Westport was 43,000 at the beginning of 1980 and has steadily decreased by 1% per year since. Write an expression that shows the population of Westport at the beginning of 1994.  
\_\_\_\_\_
4. If  $g(x)$  is the inverse of  $f(x) = x^2 - 3x + 5$ , find the point on  $g(x)$  that has a  $y$ -coordinate of 3.  
\_\_\_\_\_
5. Give an example of a linear function whose inverse is NOT a function.  
\_\_\_\_\_
6. What is the inverse of  $f(x) = 6 - 5x$ ?  
\_\_\_\_\_
7. What is the inverse of  $f(x) = 3(4)^x$ ?  
\_\_\_\_\_
8. What is the logarithmic form of  $6^3 = 216$ ?  
\_\_\_\_\_
9. Evaluate  $\log_9 27 - \log_{27} 9$ .  
\_\_\_\_\_
10. Express  $2\log 3 + 3\log 2 - \log 6$  as a single logarithm.  
\_\_\_\_\_

11. Find  $x$  if  $x$  is an integer and  $40 < \log_4 64^x < 45$ .  
\_\_\_\_\_
12. Simplify  $\log 10^9 + 10^{\log 5}$ .  
\_\_\_\_\_
13. Simplify  $\log_3 25 + \log_3 4$  and express using base-10 logarithms.  
\_\_\_\_\_
14. Solve  $2^{11-4x} = 8^{4x+1}$ .  
\_\_\_\_\_
15. Solve  $2^x = 20$ . Express the answer as a calculator-ready expression.  
\_\_\_\_\_
16. Solve  $\log_2 (3x - 4) + \log_2 (5x - 2) = 4$ .  
\_\_\_\_\_
17. Simplify  $3e^{\ln x} + 2\ln e^{x^2}$ .  
\_\_\_\_\_
18. The graph below is a transformation of  $f(x) = 2^x$ . What could it be?



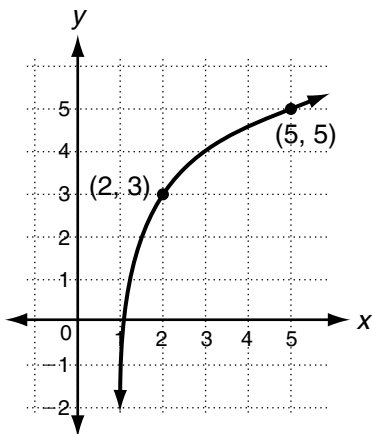
**CHAPTER**

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**Chapter Test**

**Form A** continued

19. The graph below is a transformation of  $f(x) = \log_2 x$ . What could it be?



20. If the data below is from an exponential function, what is the value of  $a$ ?

<b>x</b>	2	3	4
<b>y</b>	12	$a$	27

21. Evaluate  $f(0)$  for  $f(x) = e^x$ .

22. The data below is from an exponential function. What is the value of the constant ratio?

<b>x</b>	-1	0	1	2	3
<b>y</b>	$\frac{1}{16}$	$\frac{1}{4}$	1	4	16



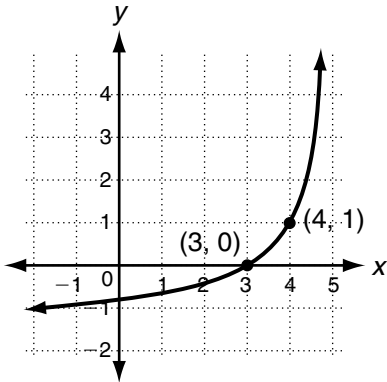
**CHAPTER**  
**7** **Chapter Test**  
**Form B**

1. If  $f(x) = a(r)^x$  is an example of exponential decay, what must be true of  $a$  and  $r$ ?  
\_\_\_\_\_
  
2. An oil painting from the early twentieth century, originally purchased for \$8500, has been increasing in value by 7.5% for the 24 years since its purchase. Write an expression that gives its current value.  
\_\_\_\_\_
  
3. The population of Greenfield was 52,500 at the beginning of 1980. Its population steadily decreased by 2.5% per year from 1980 through 1990. Write an expression for Greenfield's population at the end of 1990.  
\_\_\_\_\_
  
4. If  $g(x)$  is the inverse of  $f(x) = x^3 - 2x + 1$ , find a point on  $g(x)$  for which both coordinates are positive integers less than 10.  
\_\_\_\_\_
  
5. Give an example of a cubic function whose inverse is NOT a function.  
\_\_\_\_\_
  
6. What is the inverse of  $f(x) = 2\sqrt{3x + 4} - 1$ ?  
\_\_\_\_\_
  
7. What is the inverse of  $f(x) = 4(3)^{x-1}$ ?  
\_\_\_\_\_

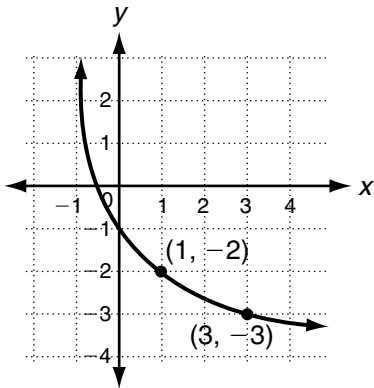
8. What is the logarithmic form of  $81^{\frac{3}{4}} = 27$ ?  
\_\_\_\_\_
  
9. Evaluate  $\log_{0.5} 4 - \log_4 0.5$ .  
\_\_\_\_\_
  
10. Express  $3\log_5 4 - 5\log_5 2$  as a single logarithm.  
\_\_\_\_\_
  
11. Find  $x$  if  $x$  is an integer and  $50 \leq \log_2 128^x \leq 60$ .  
\_\_\_\_\_
  
12. Simplify  $\frac{(10^{\log 48})}{3} - \log 10^{17}$ .  
\_\_\_\_\_
  
13. Simplify  $\log_6 25 + \log_6 20 - \log_6 5$  and express using base-10 logarithms.  
\_\_\_\_\_
  
14. Solve  $8^{x+7} = 16^{2x-1}$ .  
\_\_\_\_\_
  
15. Solve  $2^{x-1} = 12$ . Express the answer as a calculator-ready expression.  
\_\_\_\_\_
  
16. Solve  $\log_4(5x - 3) + \log_4(9 - x) = 3$ .  
\_\_\_\_\_
  
17. Simplify  $4e^{2\ln x} - (\ln e^{2x})^2$ .  
\_\_\_\_\_

**CHAPTER 7** **Chapter Test**  
**Form B** continued

18. The graph below is a transformation of  $f(x) = 2^x$ . What could it be?



19. The graph below is a transformation of  $f(x) = \log_2 x$ . What could it be?



20. If the data below is from an exponential function, what is the value of  $a$ ?

$x$	3	6	9
$y$	4	$a$	6

21. Find the  $y$ -intercept of  $f(x) = e^x$ .

22. The data below is from an exponential function. What is the value of the constant ratio?

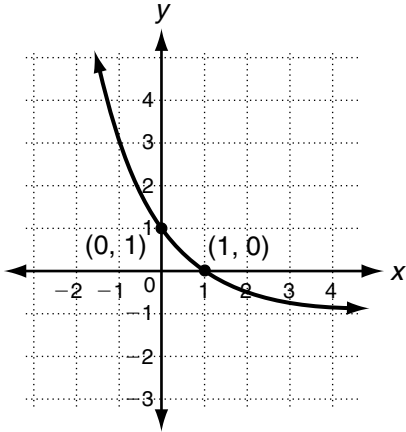
$x$	-1	0	1	2	3
$y$	$e^3$	$e^6$	$e^9$	$e^{12}$	$e^{15}$

**CHAPTER**  
**7** **Chapter Test**  
**Form C**

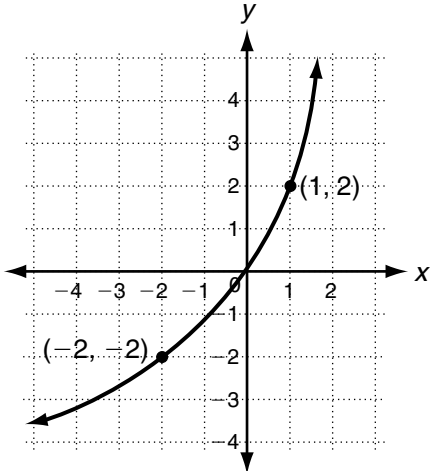
1. If  $f(x) = a(1 + r)^x$  is an example of exponential decay, what must be true of  $a$  and  $r$ ?  
\_\_\_\_\_
2. A rare postage stamp, originally purchased for \$1150, has been increasing in value at a steady rate of  $n\%$  per year. Write a function that shows the value of the stamp after  $t$  years.  
\_\_\_\_\_
3. The population of Greenfield was 52,500 at the beginning of 1980 and has steadily decreased by 2.1% per year since. Write an equation to find the year,  $t$ , when Greenfield's population will drop to 30,000.  
\_\_\_\_\_
4. If  $g(x)$  is the inverse of  $f(x) = x^3 - 3x^2 + 5$ , find all the points on  $g(x)$  for which both coordinates are positive integers less than 10.  
\_\_\_\_\_
5. Give an example of a cubic function that passes through the origin whose inverse is NOT a function.  
\_\_\_\_\_
6. What is the inverse of  $f(x) = \frac{x-1}{x+1}$ ?  
\_\_\_\_\_
7. What is the inverse of  $f(x) = 3(4)^{x-1} + 2$ ?  
\_\_\_\_\_
8. What is the logarithmic form of  $\sqrt[3]{6} = 27$ ?  
\_\_\_\_\_
9. Evaluate  $\log_{0.25}\sqrt{2} - \log_{\sqrt{2}} 0.25$ .  
\_\_\_\_\_
10. Express  $3\log_3 4 - 2\log_3 8 + 4\log_3 2$  as a single logarithm.  
\_\_\_\_\_
11. Find  $x$  if  $x$  is an integer and  $50 < \log_9 243^x < 60$ .  
\_\_\_\_\_
12. Simplify  $\log_{100} (10^{\log 10^{12}})$ .  
\_\_\_\_\_
13. Simplify  $\log_6 2 + \log_6 4 - \log_6 80$  and express using base-10 logarithms.  
\_\_\_\_\_
14. Solve  $2^{x+1} 4^{6-x} = 8^{2x-5}$ .  
\_\_\_\_\_
15. Solve  $2^{x+1} = 3^x$ . Express the answer as a calculator-ready expression.  
\_\_\_\_\_
16. Solve  $\log_2(3x + 1) - \log_2(x - 3) = \log_2(x + 3)$ .  
\_\_\_\_\_
17. Simplify  $0.25e^{2 \ln x^2} + 2 \ln e^{x^2}$ .  
\_\_\_\_\_

**CHAPTER 7** **Chapter Test**  
**Form C** continued

18. The graph below is a transformation of  $f(x) = 2^x$ . What could it be?



19. The graph below is a transformation of  $f(x) = \log_2 x$ . What could it be?



20. If the data below is from an exponential function, what is the value of  $a$ ?

<b>x</b>	2	4	8
<b>y</b>	2	$a$	8

21. Find the  $x$ -intercepts of  $f(x) = e^{(x^2 - 9x + 20)} - 1$ .

22. The data below is from an exponential function. What is the value of constant ratio?

<b>x</b>	-1	0	1	2	3
<b>y</b>	$1.25 \times 10^{13}$	$5 \times 10^{10}$	$2 \times 10^8$	$8 \times 10^5$	$3.2 \times 10^3$

- 22. F
- 23. D
- 24. H
- 25. A
- 26. J
- 27. D
- 28. F
- 29. C
- 30. G
- 31. C
- 32. G
- 33. B
- 34. F
- 35. D
- 36. J
- 37. B
- 38. H
- 39. A
- 40. J
- 41. A
- 42. G
- 43. C
- 44. F

**CHAPTER 7**

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**Section Quiz: Section A**

- 1. C
- 2. F
- 3. D
- 4. J
- 5. D
- 6. H
- 7. C

- 8. J
- 9. C
- 10. J
- 11. B
- 12. F
- 13. A
- 14. G

**Section Quiz: Section B**

- 1. D
- 2. G
- 3. C
- 4. H
- 5. B
- 6. F
- 7. B
- 8. H
- 9. D

**Chapter Test Form A**

- 1. A
- 2. A
- 3. B
- 4. B
- 5. A
- 6. D
- 7. B
- 8. B
- 9. B
- 10. D
- 11. A
- 12. A
- 13. A
- 14. B

- 15. A
- 16. A
- 17. A
- 18. B
- 19. B
- 20. A
- 21. A
- 22. C

**Chapter Test Form B**

- 1. B
- 2. G
- 3. B
- 4. H
- 5. D
- 6. J
- 7. B
- 8. F
- 9. A
- 10. F
- 11. B
- 12. J
- 13. A
- 14. H
- 15. A
- 16. J
- 17. B
- 18. G
- 19. B
- 20. G
- 21. B
- 22. J

**Chapter Test Form C**

- 1. B
- 2. F
- 3. A
- 4. H
- 5. B
- 6. G
- 7. B
- 8. J
- 9. D
- 10. F
- 11. A
- 12. G
- 13. C
- 14. H
- 15. A
- 16. F
- 17. C
- 18. G
- 19. C
- 20. F
- 21. B
- 22. J

**Chapter Test Form A**

- 1.  $r > 1$
- 2.  $2000(1.08)^9$
- 3.  $P(14) = 43,000(0.99)^{14}$
- 4.  $(8, 3)$
- 5.  $x = c$ , where  $c$  is any constant.
- 6.  $f^{-1}(x) = \frac{x - 6}{-5} = \frac{6 - x}{5}$
- 7.  $f^{-1}(x) = \log_4 \left( \frac{x}{3} \right)$
- 8.  $\log_6 216 = 3$

## Answer Key continued

9.  $\frac{5}{6}$   
10.  $\log 12$   
11.  $x = 14$   
12. 14  
13.  $\frac{\log 100}{\log 3} = \frac{2}{\log 3}$   
14.  $x = 0.5$   
15.  $\frac{\log 20}{\log 2}$  or  $\frac{\ln 20}{\ln 2}$   
16.  $x = 2$   
17.  $2x^2 + 3x$   
18.  $f(x) = 2^{x+1} - 1$  or  $f(x) = 2(2^x) - 1$   
19.  $f(x) = \log_2(x - 1) + 3$   
20.  $a = 18$   
21.  $f(0) = 1$   
22. 4

### Chapter Test Form B

1.  $0 < r < 1$   
2.  $8500(1.075)^{24}$   
3.  $52,500(0.975)^{11}$   
4. (5, 2)  
5. many answers, notably any with more than one zero  
6.  $f^{-1}(x) = \frac{\left(\frac{x+1}{2}\right)^2 - 4}{3} = \frac{x^2 + 2x - 15}{12}$   
7.  $f^{-1}(x) = \frac{\log_3 0.25x + 1}{\log x + \log 3 - \log 4} = \frac{\log 3}{\log 3}$   
8.  $\log_{81} 27 = \frac{3}{4}$   
9. -1.5  
10.  $\log_5 2$   
11.  $x = 8$   
12. -1  
13.  $\frac{2}{\log 6}$   
14.  $x = 5$   
15.  $\frac{\log 12}{\log 2} + 1$  or  $\frac{\log 24}{\log 2}$  or  $\frac{\ln 12}{\ln 2} + 1$  or

- $\frac{\ln 24}{\ln 2}$   
16. {2.6, 7}  
17. 0  
18.  $f(x) = 2^{x-3} - 1$  or  $f(x) = 0.5(2^{x-2}) - 1$   
19.  $f(x) = -\log_2(x + 1) - 1$   
20.  $a = 2\sqrt{6}$   
21. 1  
22.  $e^3$

### Chapter Test Form C

1.  $-1 < r < 0$   
2.  $1150\left(1 + \frac{n}{100}\right)^t$   
3.  $30,000 = 52,500(0.979)^{t-1980}$   
4. (3, 1), (1, 2), (5, 3)  
5. many answers, notably any with more than one zero, one of which is the origin  
6.  $f^{-1}(x) = \frac{x+1}{1-x}$   
7.  $f^{-1}(x) = \log_4 \frac{x-2}{3} + 1$   
 $= \frac{\log(x-2) - \log 3 + \log 4}{\log 4}$   
8.  $\log_{\sqrt{3}} 27 = 6$   
9. 3.75  
10.  $\log_3 16$   
11.  $x = 22$   
12. 6  
13.  $-\frac{1}{\log 6}$   
14.  $x = 5$   
15.  $\frac{\log 2}{\log 3 - \log 2}$  or  $\frac{\log 2}{\log 1.5}$  or  $\frac{\ln 2}{\ln 3 - \ln 2}$  or  $\frac{\ln 2}{\ln 1.5}$   
16. {5}  
17.  $\frac{x^4}{4} + 2x^2$   
18.  $f(x) = 2^{1-x} - 1$  or  $f(x) = 0.5(2^{2-x}) - 1$   
19.  $f(x) = -2\log_2(2 - x) + 2$   
20.  $a = 2\sqrt[3]{4}$

## Answer Key continued

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21. 4 and 5

22.  $4 \times 10^{-3}$

### Performance Assessment

1.  $2P_0 = P_0 e^{rt}$ ;  $2P_0 = P_0 e^{12r}$

2.  $2P_0 = P_0 e^{12r}$ ;  $\ln 2 = \ln e^{12r}$ ;  
 $r = \frac{\ln 2}{12} \approx 0.05776$

3.  $3P_0 = P_0 e^{rt}$ ;  $3P_0 = P_0 e^{0.05776t}$

4.  $3P_0 = P_0 e^{0.05776t}$ ;  $\ln 3 = \ln e^{0.05776t}$ ;  
 $t = \frac{\ln 3}{0.05776} \approx 19.02$

5. If it takes 12 hours to double, it would take 24 hours to quadruple, so for tripling, the answer should be somewhere between 12 and 24, and probably not too far from 18.

### Cumulative Test

1. B

2. H

3. B

4. G

5. A

6. F

7. C

8. J

9. A

10. H

11. B

12. J

13. C

14. F

15. B

16. H

17. B

18. H

19. B

20. J

21. C

22. H

23. C

24. H

25. B

26. F

27. A

28. G

29. B

30. G

31. A

32. H

33. D

34. G

35. A

36. H

37. D

38. J

39. B

40. G

41. A

42. G

43. A

44. G

45. A

46. F

47. A

48. J