Algebra 2 Chapter 8, 7-7 Review Spring 2014

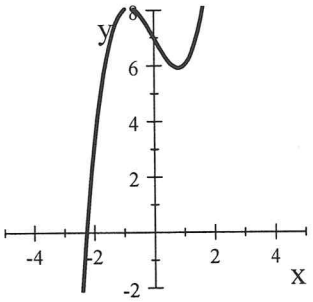
1. Write the equation of the inverse relation for each function.

a) $f(x) = \frac{2x^2 - 3}{5}$ b) $y = -3x + 1$ c) $y = -7\sqrt[5]{x-4} + 6$ d) $y = 9\left(\frac{5x-1}{8}\right)^3$

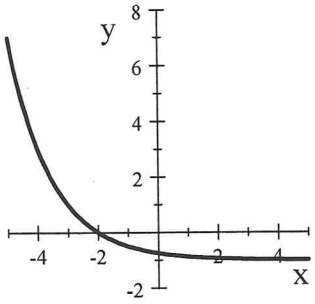
2. Tell if the inverse relation of each is a function or not.

a) $y = -\frac{2}{3}x + 7$ b) $y = (x-1)^4 + 5$

c) Use the graph below



d) Use the graph below



3. Tell if each exponential equation represents growth or decay.

a) $y = \frac{3}{7}(1.0047)^x$ b) $y = 800(0.9932)^x$ c) $y = 133(\frac{15}{12})^{-x}$ d) $y = 7.15(\frac{88}{92})^x$

4. Use the given exponential equation to find the % change and whether it represents an increase or a decrease.

a) $y = 25{,}000(1.003)^x$ b) $y = 175(0.802)^x$

5. Take the given % change and write the base that would be used in an exponential equation.

a) 23% decrease b) 1.09% increase c) 0.67% decrease d) 58% increase

6. The value of a rare painting has been increasing 13% each year. In 2005 the painting was worth $25,000.

a) Find the value of the painting in 1990.
b) Find the value of the painting in 2011.
c) In how many years will the painting be worth $1,000,000 (round to the nearest hundredth)?

7. The population of a city in 1978 was 900,000 and has been decreasing 5.9% each year.

a) Find the population in 1975.
b) Find the popution in 1999.
c) In how many years will the population be 100,000 (round to the nearest hundredth)?

8. Write each in logarithmic form.

a) $5^3 = x$ b) $x^7 = 72$ c) $4^x = 100$ d) $10^x = 211$

9. Write each in exponential form.

a) $\log_3 x = 20$ b) $\log 478 = x$ c) $\log_x 8 = 3$

10. Use all three properties of logarithms to expand each logarithm.

a) $\log_3 \frac{\sqrt{A}}{B^2C^5}$ b) $\log \frac{P^8R^2}{\sqrt{S^3T}}$ c) $\log\left(M^4\left(\frac{N^7}{\sqrt[3]{Q}}\right)^2\right)$

11. Use all three properties of logarithms to write each as a single logarithm. Simplify.

a) $3\log_2 W + \log_2 X - \frac{1}{2}\log_2 M$ b) $2\log R - 3\log Q + \log A$

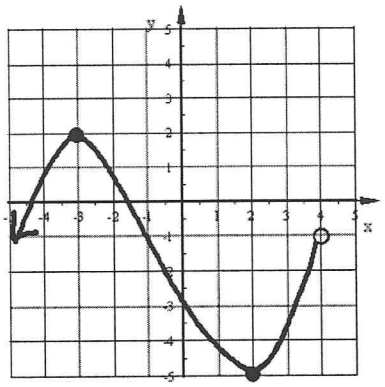
Solve each logarithmic or exponential equation. Round decimal answers to the nearest thousandth.

12. $5^{2x} = 42$ 13. $\log_x 40 = 3$ 14. $3^{x+2} = 30$ 15. $\log_3 x = 5$

16. $\log_4(2x + 7) = 3$ 17. $\log x - \log(x - 6) = 3$ 18. $2 \cdot 7^{5x-3} - 9 = 73$

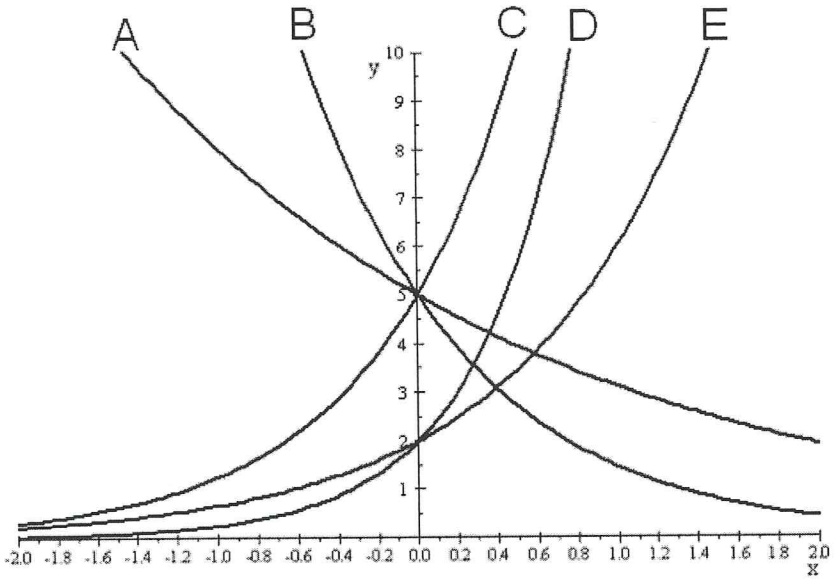
19. $\log_3 x + \log_3(x - 6) = 3$ 20. $\log_3 4 + \log_3 x = 5$

21. State the domain and range of the inverse of the relation shown in the graph:



22. Match the following equations with their graphs.

a) $y = 5(4)^x$ b) $y = 5(0.62)^x$ c) $y = 2(8)^x$ d) $y = 2(3)^x$ e) $y = 5(0.29)^x$



Algebra 2 Chapter 8, 7-7 Review **ANSWERS** Spring 2014

1. a) $f^{-1}(x) = \pm\sqrt{\frac{5x+3}{2}}$ b) $f^{-1}(x) = \frac{x-1}{-3}$ c) $f^{-1}(x) = \left(\frac{x-6}{-7}\right)^5 + 4$ d) $f^{-1}(x) = \frac{8\sqrt[3]{\frac{x}{9}} + 1}{5}$

2. a) Yes b) No c) No d) Yes 3. a) Growth b) Decay c) Decay d) Decay

4. a) 0.3% increase b) 19.8% decrease

5. a) $b = 0.77$ b) $b = 1.0109$ c) $b = 0.9933$ d) $b = 1.58$

6. a) \$3997.27 b) \$52,048.79 c) 30.18 years

7. a) 1,080,124 people b) 250,972 people c) 36.13 years

8. a) $\log_5 x = 3$ b) $\log_x 72 = 7$ c) $\log_4 100 = x$ d) $\log 211 = x$

9. a) $3^{20} = x$ b) $10^x = 478$ c) $x^3 = 8$

10. a) $\frac{1}{2}\log_3 A - 2\log_3 B - 5\log_3 C$ b) $8\log P + 2\log R - \frac{3}{2}\log S - \frac{1}{2}\log T$
c) $4\log M + 14\log N - \frac{2}{3}\log Q$

11. a) $\log_2 \frac{W^3 X}{\sqrt{M}}$ b) $\log \frac{R^2 A}{Q^3}$ 12. $x = 1.1612$

13. $x = 3.420$ 14. $x = 1.096$ 15. $x = 243$

16. $x = 28.5$ 17. $x = 6.006$ 18. $x = 0.982$

19. $x = 9$ 20. $x = 60.75$
21. Domain of $f^{-1}(x)$: $x \leq 2$ Range of $f^{-1}(x)$: $y < 4$
22. a) C b) A c) D d) E e) B