

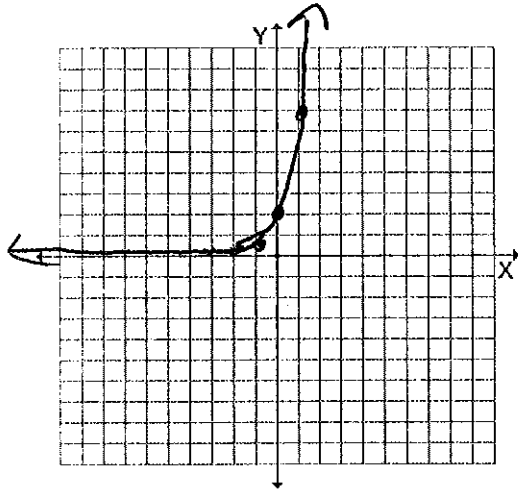
Unit 6 Review

Name _____ Hr. _____

SHOW ALL WORK!!!

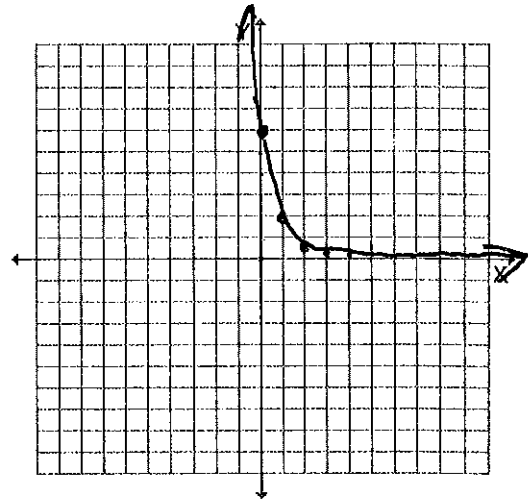
Graph each function and state the domain and range.

1. $y = 2(3)^x$



D: \mathbb{R}
 R: $y > 0$

2. $y = 6\left(\frac{1}{3}\right)^x$



D: \mathbb{R}
 R: $y > 0$

For Questions 3 and 4, determine whether each function represents exponential growth or decay.

3. $y = 5(0.7)^x$

decay

4. $y = \frac{1}{3}(4)^x$

growth

For Questions 5 and 6, write an exponential function whose graph passes through the given points.

5. (0, -2) and (3, -54)

$$\frac{-54}{-2} = \frac{-2b^3}{-2}$$

$$27 = b^3$$

$$b = 3$$

$$y = -2(3)^x$$

6. (0, 7) and (1, 1.4)

$$\frac{1.4}{7} = \frac{7b^1}{7}$$

$$b = .2$$

$$y = 7(.2)^x$$

For Questions 7 and 8, write each equation in logarithmic form. (Rock & Roll!)

7. $7^3 = 343$

$$\log_7 343 = 3$$

8. $5^{-2} = \frac{1}{25}$

$$\log_5 \frac{1}{25} = -2$$

For Questions 9 and 10, write each equation in exponential form. (Rock & Roll!)

9. $\log_4 64 = 3$

$$4^3 = 64$$

10. $\log_6 \frac{1}{36} = -2$

$$6^{-2} = \frac{1}{36}$$

For Questions 11-14, evaluate each expression. (Set each equal to y and solve!)

11. $\log_{10} \frac{1}{10000}$

$$-4$$

12. $\log_7 7^{-5}$

$$-5$$

13. $\log_{81} 3$

$$\frac{1}{4}$$

14. $\log_{13} 169$

$$2$$

For Questions 15-26, solve each equation.

15. $9^x = \frac{1}{81}$

$$9^x = \frac{1}{9^2}$$

$$9^x = 9^{-2}$$

$$x = -2$$

17. $49^{3p+1} = 7^{2p-5}$

$$(7^2)^{3p+1} = 7^{2p-5}$$

$$6p+2 = 2p-5$$

$$\begin{array}{r} -2p-2 \\ \hline 4p = -7 \end{array}$$

$$\frac{4p}{4} = \frac{-7}{4}$$

$$p = -\frac{7}{4}$$

16. $2^{6x} = 4^{5x+2}$

$$2^{6x} = 2^{2(5x+2)}$$

$$2^{6x} = 2^{10x+4}$$

$$\begin{array}{r} 6x = 10x + 4 \\ -10x \quad -10x \\ \hline -4x = 4 \end{array}$$

18. $\log_4 x = \frac{1}{2}$

$$4^{\frac{1}{2}} = x$$

$$\sqrt{4} = x$$

$$x = \pm 2$$

$$x = -1$$

19. $\log_3 x = 2$

$3^2 = x$

$x = 9$

20. $\log_{81} 729 = x$

$x = 1.5$

21. $\log_8(3y-1) = \log_8(y+5)$

$3y-1 = y+5$
 $-y+1 \quad -y+1$

$2y = 6$ $y = 3$

22. $\log_6 2c + \log_6 8 = \log_6 80$

$\frac{16c}{16} = \frac{80}{16}$

$c = 5$

23. $\log_2 4 - \log_2(x+3) = \log_2 8$

$\frac{4}{x+3} = 8$

$x = -\frac{5}{2}$

$8x + 24 = 4$
 $-24 \quad -24$

$\frac{8x}{8} = \frac{-20}{8}$

24. $3\log_7 4 = 2\log_7 k$

$4^3 = k^2$

$\sqrt{64} = \sqrt{k^2}$

$k = \pm 8$

25. $\log_5 7 + \frac{1}{3}\log_5 4 = \log_5 x$

$14 = x$

26. $2\log_2 x - \log_2(x+3) = 2$

$\log_2 \frac{x^2}{x+3} = 2$

$2^2 = \frac{x^2}{x+3} \quad \frac{4}{1} = \frac{x^2}{x+3}$

$x^2 = 4x + 12$

For Questions 27 and 28, find the inverse of the function.

27. $f(x) = 3x - 4$

$y = 3x - 4$

$x = 3y - 4$
 $+4 \quad +4$

$\frac{8y}{3} = \frac{x+4}{3}$

$f^{-1}(x) = \frac{1}{3}x + \frac{4}{3}$

28. $g(x) = \frac{1}{3}x + 2$

$y = \frac{1}{3}x + 2$

$x = \frac{1}{3}y + 2$
 $-2 \quad -2$

$(\frac{1}{3})x = (\frac{1}{3})y - 6$

$x = 3x - 6$
 $f^{-1}(x) = 3x - 6$

$x^2 - 4x - 12$

$\frac{-24}{-4}$

$x = 6$
 $x = -2$

29. Graph the function $x = \log_{2.3}(y)$.

$$y = 2.3^x$$

x	y
-4.35	-1
1	0
2.3	1
5.29	2
12.167	3

29.

