Algebra 2
7.1 – 7.3 Review

Name Key
Date _____ Hour _____

Without graphing, determine whether the function represents exponential growth or exponential decay. Then find the *y*-intercept.

1. $y = 0.99\left(\frac{1}{3}\right)^x$
decay
(0, .99)

2. $y = 0.2(1.75)^x$
growth
(0, .2)

3. $y = 185(\frac{5}{4})^x$
growth
(0, 185)

Predict the population of bacteria for each situation and time period.

4. 55 bacteria that double every hour
a. after 3 hours $y = 55(2)^x$
$y = 55(2)^3$
$= 440$

b. after 5 hours
$55(2)^5$
1760

5. 33 *E.coli* bacteria that triple every 30 minutes
a. after 4 hours $y = 33(3)^x$
$y = 33(3)^8$
216,513

b. after 6 hours
$y = 33(3)^{12}$
$= 17,537,553$

6. The population of Indonesia was 191,256,000 in 1990 and was growing at a rate of 1.9% per year. Predict the population, to the nearest hundred thousand, of Indonesia in 2010.
$1 + r$
$(1 + .019)$
$191256000(1 + .019)^{20}$

7. The population of Florida is 17,091,244 is the 2011 census. If the population increases at at rate of 6.2% per decade, predict the population of Florida is 2025. Round your answer to the nearest ten thousand.
$17091244(1 + .062)^{1.4}$
2011
2021
10
1.4
5

8. A dye is injected into the pancreas during a certain medical procedure. A physician injects 0.3 grams of the dye, and a healthy pancreas will secrete 4% of the dye each minute. Predict the amount of dye remaining, to the nearest hundredth of a gram, in a healthy pancreas 30 minutes after the injection.
$.3(1 - .04)^{30}$
.088

9. A new car that sells for $18,000 depreciates 25% each year. What is it's estimated value After 4 years?
$18000(1 - .25)^4$
$5695.31

10. The price of a new home is $350,000. the value of the home appreciates 2% each year.

a. How much will the home be worth in 10 years?

$350{,}000(1+.02)^{10}$

$\$426{,}648.05$

b. What is the effect of doubling the annual interest rate?

$350{,}000(1+.04)^{10}$

$518{,}085.50$

c. What is the effect of doubling the investment period?

$350{,}000(1+.02)^{20}$

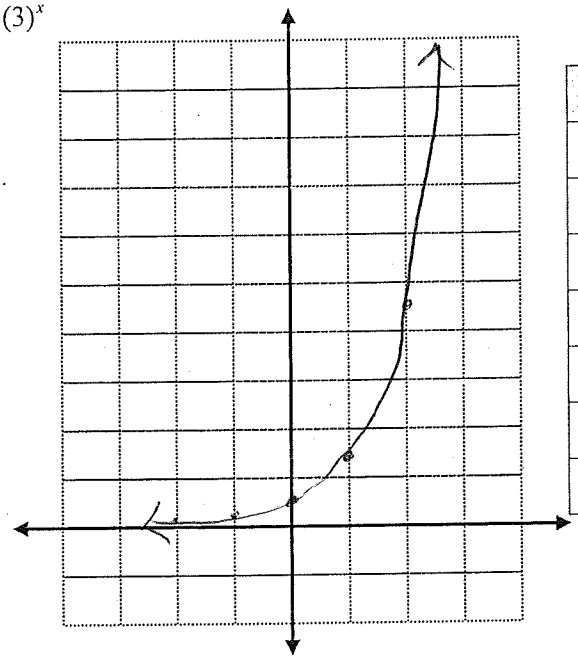
$520{,}081.59$

d. Which of the above has the greatest effect on the final amount of the investment?

$y = \frac{3}{10}^{x}$

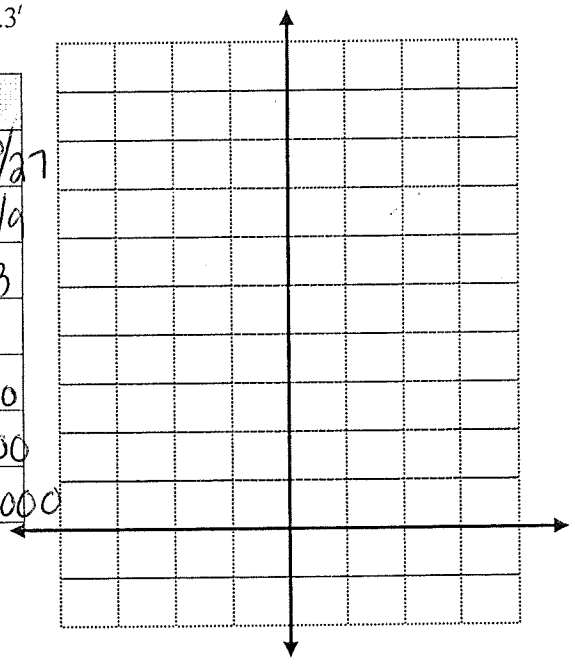
11. $y = \frac{1}{2}(3)^x$

x	y
−3	
−2	1/18
−1	1/6
0	1/2
1	3/2
2	9/2
3	



12. $s(t) = 0.3^t$

x	y
−3	1000/27
−2	100/9
−1	10/3
0	1
1	3/10
2	9/100
3	27/1000



13. Determine if each table represents a linear, quadratic, or exponential function.

a. linear b. exponential c. quadratic d. exponential

x	y
4	25
8	14
12	3
16	−8

x	y
1	6
2	18
3	54
4	162

x	y
12	75
14	43
16	20
18	6

x	y
3	160
6	80
9	40
12	20

Identify each function as linear, quadratic, or exponential.

14. $g(x) = 10x + 3$ linear

15. $f(x) = (44 - x)x$ quadratic

16. $f(x) = 12(12.5)^x$ exponential

17. $h(x) = 0.5^x - 3.5$ exponential

Find the final amount of each investment.

18. $1000 at 6% interest compounded semiannually for 20 years.

$1000\left(1+\frac{.06}{2}\right)^{2(20)}$

29. $750 at 5.6% interest compounded quarterly for 10 years.

$750\left(1+\frac{.056}{4}\right)^{4(10)}$

20. $1800 at 6.65% interest compounded daily for 8 years.

$1800\left(1+\frac{.0665}{365}\right)^{365(8)}$

$A = Pe^{rt}$

Find the amount in a continuously compounded account for the given conditions.

21. principal: $5000
annual interest rate: 6.9%
time: 30 yr

$5000\,e^{(.069(30))}$

22. principal: $20,000
annual interest rate: 3.75%
time: 2 yr

$20000\,e^{.0375(2)}$

Write each equation in logarithmic form.

23. $3^4 = 81$

$\log_3 81 = 4$

24. $\left(\frac{1}{4}\right)^3 = \frac{1}{64}$

$\log_{\frac{1}{4}} \frac{1}{64} = 3$

25. $5^{-3} = \frac{1}{125}$

$\log_5 \frac{1}{125} = -3$

Write each equation in exponential form.

26. $\log_{14} 196 = 2$

$14^2 = 196$

27. $\log_6\left(\frac{1}{1296}\right) = -4$

$6^{-4} = \frac{1}{1296}$

28. $\log_{17} 289 = 2$

$17^2 = 289$

Solve each equation for x. Round your answers to the nearest hundredth. **SHOW WORK**

29. $10^x = 1502$

$\log_{10} 1502 = x$

$x = 3.18$

30. $10^x = 7.8$

$\log_{10} 7.8 = x$

$.89$

31. $10^x = 0.835$

$\log_{10} .835 = x$

$-.08$

Find the value of v in each equation. **SHOW WORK**

32. $v = \log_4 256$

$4^v = 256$

$x = 4$

33. $v = \log_{13} 1$

$13^v = 1$

$v = 0$

34. $\log_5 v = 4$

$5^4 = v$

$v = 625$

35. $\log_6 \frac{1}{36} = v$

$6^v = \frac{1}{36}$

$v = -2$

36. $7 = \log_v 128$

$\sqrt[7]{v^7} = \sqrt[7]{128}$

$128^{\wedge}(1\div7)$

$v = 2$

37. $\log_2 v = -6$

$2^{-6} = v$

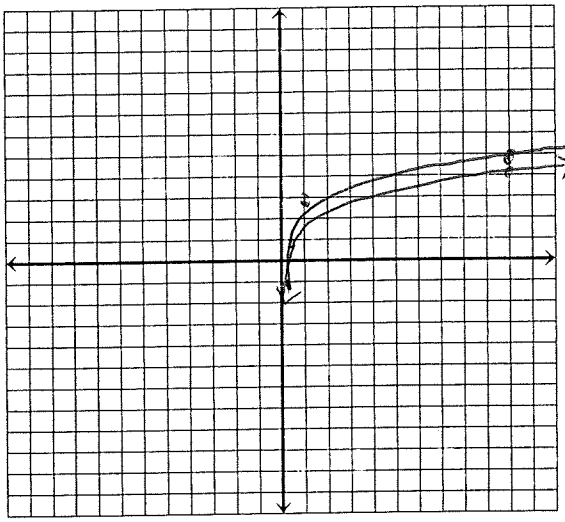
$\frac{1}{64} = v$

Graph each function. Graph at least 5 points. Identify the domain and range.

38. $y = 2\log_{10} x + 3$

$10^y = x$

x	y
$\frac{1}{100}$	-1
$\frac{1}{10}$	1
1	3
10	5



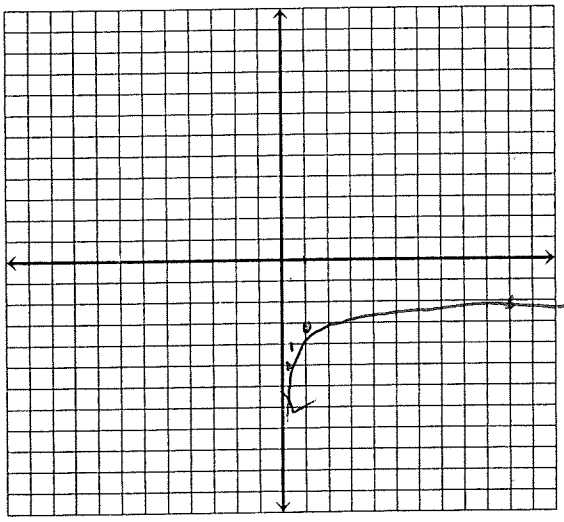
Domain $x > 0$

Range all

39. $y = -3 + \log_{10} x$

$10^y = x$

x	y	
$\frac{1}{100}$	-2	-5
$\frac{1}{10}$	-1	-4
1	0	-3
10	1	-2



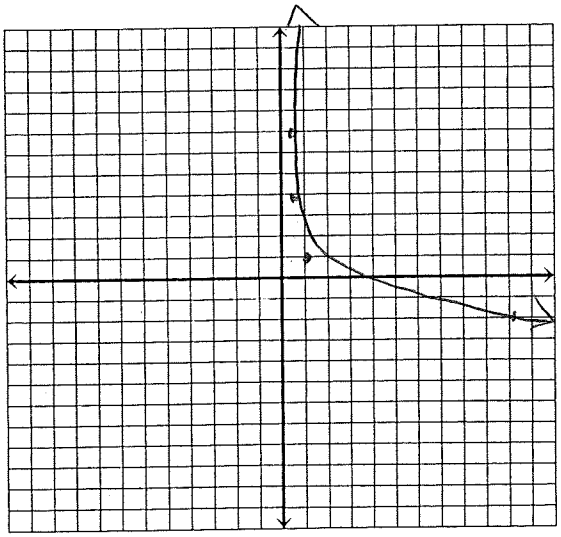
Domain $x > 0$

Range all

40. $y = -3\log_{10} x + 1$

$10^y = x$

parent x	y	new y
-2	$\frac{1}{100}$	7
-1	$\frac{1}{10}$	4
0	1	1
1	10	-2



Domain $x > 0$

Range ARN